

# MARINE REVIEW

VOL. XIX.

Published every Thursday at 418-19 Perry-Payne Bldg., by the Marine Review Pub. Co.

CLEVELAND, O., MARCH 9, 1899.

Entered at Cleveland Postoffice as second class matter.

No. 10

## GRAIN BILL OF LADING.

ALL INTERESTS REPRESENTED AT THE BUFFALO CONFERENCE—SHREWD DELEGATION OF GRAIN MERCHANTS FROM NEW YORK AND PHILADELPHIA—WILLING TO DO SOMETHING IN THE MATTER OF DETENTION BUT DETERMINED TO HOLD THE SHORTAGE CLAUSE.

Buffalo, N. Y., March 15.—Not all that the vessel men hoped for in taking a stand on proposed changes in the grain bill of lading of the great lakes is to be secured as a result of the conference that has been going on here for two days, but it is certain that some advantages from the ship owners' standpoint are already within reach, and he is still in position to hold out for the changes that were outlined at Detroit, if concessions from the grain interests are not satisfactory. As a brief introduction to details of this meeting, which has been looked forward to with so much interest, it may be said that the grain men have taken a decided stand against relinquishing any part of the present shortage clause, but have shown a willingness to trade off for their position on this score some measure of relief to the vessel in the matter of detention, especially at Buffalo. The one great point on which the grain interests have opposed every substitute proposing to release the vessel from payment of shortage is that any change in the bill of lading in this regard would disrupt an essential feature in the financing of their business. It is not probable that final settlement of the several questions involved will be reached at the present conference. Committee work will still be required, and the sanction of the general interests on both sides may yet be found necessary. There is also a strong element among the vessel owners who feel that unless the remedy regarding detention is of a substantial kind, they should return to the provisions of the Detroit agreement and enter into the real struggle that they have sought to avoid by conferences with the grain men.

The position of the vessel owners, outlined in the report of a special committee of the Lake Carriers' Association at the annual meeting of that body in Detroit in January last, is quite well understood. After a discussion in Detroit extending over two days, with what seemed to them as a full regard for the several interests connected with the transportation of grain, they concluded that a new grain bill of lading should contain these provisions: First, a clause limiting the shortage for which the vessel should be held liable to one-half bushel per thousand; second, a reasonable provision regarding detention in loading or unloading, and on this score it was proposed that the shipper on the one hand and the consignee on the other should each have twenty-four hours in which to provide an elevator, and that in event of failure so to do, demurrage, based on a certain proportion of the freight, should be paid. The third clause was of a kind intended to protect the ship against liability for wrong delivery, which is said to occur in rare instances, not through any fault of the vessel, but through error in consignment. This clause, which would not be a subject of controversy on either side, provided that delivery to the party to whom consigned should constitute a good delivery.

### WHY THE GRAIN INTERESTS WERE CONSULTED.

Reasonable as it might seem from their standpoint, the vessel owners fully understood that to insist upon such a position without consulting the grain interests would create a great disturbance. The shippers of grain at Chicago and Duluth, elevators at Buffalo, railroads operating between Buffalo and the seaboard, and eastern buyers of grain were to be considered. They were all represented at the conference here today. The vessel men met first to talk over their plans, giving up all of Tuesday to the subject. Members of the original bill of lading committee consisting of L. C. Waldo of Detroit, D. Sullivan of Chicago, A. W. Colton of Toledo, H. Coulby of Cleveland, Capt. J. J. H. Brown of Buffalo, David Vance of Milwaukee and A. B. Wolvin of Duluth were all present excepting Messrs. Vance and Wolvin. But as the executive committee and other leading members of the Lake Carriers' Association has been invited to take part in the conference, the vessel owners were also represented by President Frank J. Firth of Philadelphia, Secretary C. H. Keep of Buffalo, Counsel Harvey D. Goulder of Cleveland, J. S. Dunham of Chicago, L. M. Bowers, R. R. Rhodes and B. L. Pennington of Cleveland, E. T. Evans, G. L. Douglas, W. C. Farrington and Messrs. French and Hebard of Buffalo, as well as R. T. Gray of Detroit. Messrs. Douglas and Farrington, on account of their elevator interests, the one representing the New York Central and the other the Great Northern Ry., might be said to be on both sides of the questions under discussion, but they met on a couple of occasions with the vessel owners.

The meeting of the vessel owners on Tuesday developed little more than a plan of procedure whereby all interests might be heard fairly when the grain men and railway men arrived. The representatives of the vessel owners wanted to be sure, of course, of their position in event of no agreement at the conference, which might necessitate their standing out, and saying to the other side that they were prepared for a struggle and would await developments on the opening of navigation. They had also sought an individual expression of opinion in writing from every member of the association. These opinions in answer to circular letters, sent out by Mr. Keep, were very numerous, representing some 460,000 tons of vessels holding membership in the association. They were all of a kind promising support to any action that might be taken by the vessel representatives, with the exception that a few expressed the opinion that the shortage clause was of such vital importance in financing the grain business that it would be treading on dangerous ground to disturb it.

### PROPOSED INSURANCE AGAINST SHORTAGE.

One new feature was developed at this meeting. A proposition was made by a couple of gentlemen from Duluth to insure the vessels against shortage of more than a quarter of a bushel per thousand. The parties making this proposition said they could furnish the insurance for about 25 cents per thousand bushels, which is only a trifle more than is now paid by the vessel at both ends of the lake route for weighing and tallying grain. Their plan was, of course, to relieve the vessel of everything pertaining to the weighing of grain cargoes. They claimed to have made conservative figures on costs of this kind. They were to organize a company and give the vessel men assurance that sufficient capital was back of the scheme. But the proposition was dependent mainly upon all of the vessel owners taking such insurance, and in this it was weak, as in a matter of this kind executive officers of the Lake Carriers' Association could speak only for themselves. They could not act in an insurance matter for the entire association. The scheme was weak in other points, also. The vessel owners were contending with the grain men that the shortage was not a matter with which they should be called upon to deal in any way. To take up an insurance proposition on shortages would, therefore, be an acknowledgment which the vessel owner was avoiding. This insurance scheme was referred to several times throughout the conference but never seriously considered. It led up, however, to a suggestion from Mr. L. C. Waldo which it was thought might be used when the two interests, grain and ships, were ready to give and take on the two questions of shortage and demurrage. Mr. Waldo thought—and the meeting agreed with him—that possibly the grain men would find some way of assuming the shortage liability and freeing the vessel entirely on that point, if the vessel men would agree to rebate from their freight 25 cents on each thousand bushels. The vessel now pays about 22 cents for weighing and tallying, and would be willing to give up a little more on this account if relieved of the shortage difficulty. The elevator and grain interests could have the weighing and tallying done at less cost than the vessels. It was thought that this proposition might be used to advantage by the vessel men at some stage of the conference, but whenever referred to it was frowned upon.

Immediately following Tuesday's meeting it was agreed on all hands that the vessel owners were fortunate in having such a man as Mr. Firth for president of their organization. He is a great executive. He had planned things so as to have Tuesday's meeting run smoothly. His plans for Wednesday's meeting, the conference of the several grain interests with the vessel men, were equally well arranged. The eastern representatives were an especially bright lot of men. The vessel owners learned this at the outset. They knew what they had to meet and were careful of their ground.

### THE GRAIN REPRESENTATIVES.

The representatives of the grain interests were as follows: Buffalo Merchants' Exchange, E. T. Evans, Frederick Truscott, Chas. H. Gibson; Western Elevating Association, Edward Michael, Leonard Dodge, R. L. Fosburg; New York Produce Exchange, John P. Truesdale, Franklin Quinby, Otto E. Lohrke, John Valiant, Harry B. Day; Toledo Produce Exchange, E. O. Paddock and Mr. Churchill; Chicago Board of Trade, James A. Patton, H. H. Peters, Wm. J. Nye, Geo. S. McReynolds, and Mr. Fitch; Duluth grain shippers and elevator representatives, Geo. Spencer, Ward Ames; Philadelphia Commercial Exchange, Lincoln K. Passmore and Mr. Omerley; trunk line representatives, David D. Allerton and Mr. Frank Harriott of the Erie Railroad, H. H. Kingston, general traffic manager of the Lehigh Valley, W. A. Fleming of D. L. & W., and G. L. Douglas of the New York Central.

Immediately upon the opening of the conference Wednesday, Mr. Firth stated briefly the objects for which the Lake Carriers' Association is formed and what it has accomplished in the cheapening of transportation charges. Mr. H. Coulby of Cleveland, representing the executive committee of the Lake Carriers, read the report of the bill of lading committee, stating that it is simply submitted to the executive committee, and that the executive committee had not taken any action on it, and would not do so pending the result of this conference. The two points which it was desired to accomplish were, first, to secure a fair allowance if vessels are unreasonably delayed, and second, to be protected in the matter of grain shortages. The conference had been called to decide in what method this could best be accomplished, so that no interest would suffer. The vessel interests do not desire to collect any demurrage, he said, but they want to be relieved from the delays to which they have been subjected, and they therefore ask the party to the conference to devise means by which these delays may be saved. One method that had been suggested was to bring all the elevators in Buffalo into an association under conditions that would insure the vessels having the benefit of all elevators in the harbor, in order that delays might be avoided. It was also desired that the rail lines should do everything in their power to keep up their car supply, and to so handle the business as to minimize the delays. The vessel owners further wanted the shippers of grain to so consolidate their cargoes that vessels may not have to go to an unnecessary number of elevators at point of loading, or to an unnecessary number of elevators at point of discharge. The Lake Carriers desired further that an arbitration committee might be designated at Buffalo, to whom could be referred all questions of exceptional demurrage or exceptional shortage, so that each of these cases might be settled without unnecessary resort to litigation.

### HOW DISCUSSION WAS REGULATED.

In order to promote discussion this proposition was presented to the meeting: "When vessels are unreasonably delayed in loading or unloading, the vessel owner is entitled to compensation for lost time." Hinging

Continued on page 14.



# COAL FOR NAVAL VESSELS

A HIGHLY INTERESTING DISCUSSION FOLLOWS THE INTRODUCTION OF AN AMENDMENT TO THE NAVAL BILL APPROPRIATING \$20,000 TO TEST THE QUALITIES OF SMOKELESS COAL—THE COURT OF INVESTIGATION RECENTLY APPOINTED REPORTS REASONS FOR THE PREFERENCE OF THE NAVY DEPARTMENT FOR BITUMINOUS AND SPONTANEOUS COMBUSTION.

When the House of Representatives in its consideration last week of the naval appropriation bill reached the clause appropriating \$25,000 to continue experiments with smokeless powder, Representative Charles N. Brunn of Pennsylvania offered an amendment to devote \$20,000 "to experiments to test the qualities of smokeless coal for use on all the vessels of the navy," and while this proposition was made with a special view to the utilization of a certain grade of anthracite coal, it still brought out some very interesting facts. Mr. Brunn in his opening argument pointed out the disadvantage of maneuvering with smoky coal, as demonstrated at Manila when Dewey entered the harbor, and also at Santiago. He argued that inasmuch as we have the only coal in the world that is entirely smokeless we are in possession of an immense advantage over other navies by reason of our possession of a clear view in action and in all maneuvers, while an enemy would be obstructed in view and exposed in maneuvers and action.

The next contention made was that smokeless coal has an advantage over bituminous coal in that it will not ignite spontaneously, thus obviating the necessity for worryment over a problem for which naval officers have not as yet been able to find any solution. In this connection there was submitted a statement from Secretary of the Navy Long showing that during the past year the collier Alexander caught fire once from spontaneous combustion in her coal bunkers; the collier Hannibal, twice; cruisers Minneapolis, Philadelphia, St. Paul and Topeka, once each; the battleship Oregon twice, and the cruisers Yankee and Yosemite three times each.

It is well known, of course, that the United States navy department, as well as the navy departments of foreign powers, have all along shown the most marked preference for Pocahontas coal, which, while not altogether smokeless is nearly so, and possesses so many other exceptional qualities as to entirely outweigh lack of the smokeless feature. Some of the considerations that have weighed with the department in their unswerving loyalty to this grade of coal are set forth in a report prepared a few weeks ago by a court consisting of Lieutenant Thomas D. Griffin, Passed Assistant Engineer W. M. McFarland and Chemist Joseph Westesson, who were appointed by Secretary Long to investigate the subject of the spontaneous ignition of coal, particularly in the coal bunkers of ships, and its prevention, and whose report in full was introduced in the discussion in the house last week, and indeed constituted its most interesting feature. The report of the navy officers mentioned is in part as follows:

"In former days, when ships were under steam only a part of the time, when steam pressures were lower, when there were no protective decks and bunkers over the boilers, and there was ample circulation of air around the boilers, cases of spontaneous ignition were almost unknown in bunkers; but modern war vessels have all these conditions changed, and for some bunkers there is sure to be, when adjacent boilers are in use, a sufficiently high external temperature to cause the spontaneous ignition of any coal at all liable to that phenomenon. It should not be inferred, however, that spontaneous ignition is a frequent occurrence, even under the more favorable modern conditions. The total number of fires due to this cause in the last three and one-half years, counting the fire in each bunker as a separate fire, is only twenty on ten ships, and when we reflect that during that time there have been at least forty ships in commission, averaging probably forty bunkers each, which have probably coaled an average of twenty times, the percentage of bunker fires is seen to be very low. While it is desirable, if possible, to eliminate bunker fires altogether, yet if the precautions necessary to this end require great expense or are undesirable for other reasons, we must adopt such reasonable expedients as commend themselves to practical considerations and to the need of each particular case.

"In a modern war vessel great coal-carrying capacity is one of the first considerations, and ready access to the coal from the fire rooms is almost as important. Both compel the construction of coal bunkers in close proximity to the boilers. Moreover, the construction of such a vessel from necessity prevents any general circulation of air sufficient to prevent a considerable elevation of temperatures near the bunkers. We have data of cases where such temperatures have attained 200° F. Professor Lewes of the Royal Naval College, Greenwich, recommends provision for a water wall between the bunkers and the boilers or uptakes in such cases, but there are several practical objections to such a plan which we consider conclusive. A double bulkhead with air circulation involves practical objections which will be obvious on consideration, so that in our judgment, except as hereafter stated, we do not recommend any structural changes. There are some bunkers in which a fire would involve great danger, namely, those adjacent to magazines, while in others the loss of the coal would be a serious matter if the ship had a small bunker capacity and was making a long passage, and in time of action such a fire calling for extra work on the part of the engineer's forces would be a serious matter. On the magazines which caused a charring of wood work in the latter, and if they had not fortunately been discovered in time there might have been in the New York and the Cincinnati there were fires in the bunkers next to each case a terrible disaster. For such cases we do consider structural provision an absolute necessity, and that no magazine should ever be separated from a coal bunker by a single bulkhead only.

"There should always be a double bulkhead with at least four inches between the walls of the bunkers and magazines and with provision for a good circulation of air to carry off any heat that may come from the

bunker. In order to avail ourselves of expert opinion on the structural question, we requested the views of the chief constructor of the navy, and find from his reply that he had anticipated this important point, and provision is made in the new battleships on practically the plan which we recommend, while the board on construction had recommended the fitting of an additional bulkhead in the bunkers of the New York, adjacent to the magazines, with provision for air circulation. The precautions considered necessary to prevent fires and to discover and extinguish them in bunkers not adjacent to the magazines are presented further on.

"With regard to fires in bunkers we submit the following recommendations: First, No magazine should be separated from a coal bunker by a single bulkhead only, but in all cases there should be a double bulkhead with efficient air circulation, artificial if necessary. Second, The temperature of spaces near bunkers where it is likely to be high, should be observed, and where it will be sufficiently great to be likely to cause spontaneous ignition these bunkers should be kept normally empty if the total coal capacity is sufficiently great. If they must be kept filled, a coal should be chosen which is least likely to give trouble. On our eastern coast anthracite coal fulfills this condition completely, as diligent inquiry has not developed a single instance of spontaneous ignition of anthracite in such sizes as come on board ship. In Europe and many foreign ports this condition would be met by briquettes or 'patent' fuel. This is composed of bituminous slack bound together by tar, pitch, or flour paste, and from its nature and method of manufacture has not the conditions for absorbing oxygen. Where neither of these is attainable, a semi-bituminous coal with a low percentage of volatile combustible matter should be chosen and stowed in large lumps only.

"With respect to the temperature likely to cause ignition, Professor Lewes states: 'If the bunker coal next the bulkhead be kept at 120° F., any coal with a tendency to absorb oxygen will run a great chance of igniting within a few days.' He assumes that this is probable temperature if that outside the bulkhead is 200° F. This is a point that can only be settled by experience, as the data available to us do not warrant a definite limit being assigned. Where bunkers are exposed to such great heat they should be examined, if practicable, at regular intervals, to ascertain if the temperature rises or if vapor or smoke is emitted. There should be as much space as practicable between the bunkers and boilers or uptakes. This is a question of design and no hard and fast rule can be laid down. We would recommend, however, a minimum space of ten inches from the shells of cylindrical boilers, and at least 18 inches from uptakes and the casings of water-tube boilers where the latter really serve as uptakes; and, if practicable, there should be air circulation. Lump coal of large size and as free from small coal and slack as possible is to be preferred. In the ordinary purchase of coal some slack is inevitable, but where there is room for choice, other things being equal, large lumps should be chosen. If practicable to get it, coal that was screened before shipment should be preferred. Coal with a very high percentage of combustible volatile matter should be avoided. Tables showing the percentage are readily accessible generally or can be obtained from reliable dealers, and, in our opinion, true economy dictates the avoidance of all others. The coal should not contain a large amount of pyrites.

"In choosing coals, the coal efficiency reports will indicate the relative values of those that have been used at home and abroad, and the admiralty list will also aid in the selection on foreign stations. In any case, coals of established reputation should be chosen, even at a higher price. This is authorized by law, and the practice is strongly urged. A standard coal is apt to be freer from slack and pyrites than coal of poor quality, and not only less liable to spontaneous ignition, but also cheaper in the end. The reports show that the Philadelphia can steam 7,170.6 knots, using Albion Cardiff coal, at a total cost of \$7,282.8, and that it would cost \$7,433.7 using Comox coal, although the former costs \$7.14 a ton and Comox \$5.65 a ton. With respect to moisture, we consider it preferable on every ground to take the coal on board dry; but when necessary to take it on board wet, such coal should be used first if practicable, and the bunkers in which it is put examined at regular intervals. In general, recently mined coal should not be taken. The authorities already cited explain this fully. The fresh coal is more greedy of oxygen than after the absorbing process has proceeded for some time. Ordinarily our ships on foreign stations can not get freshly mined coal, so that they avoid this risk. The coal should be at least a month from the mine. Precautions should be taken to prevent waste or oil from getting into the bunkers and old coal should be used before that recently received.

"With respect to the extinguishing of fires in bunkers, the means now provided appear the best practicable. The bureau of steam engineering provides a steam pipe to each bunker in order that in case of fire an atmosphere of steam which will not support combustion may drive out the air. The reports show that these have been employed effectively; but it has been suggested that if the pipes for admitting the steam were placed on the bottom of the bunker instead of the top, the system would prove more efficient. Otherwise the steam escapes through the bunker exhaust pipes. The bunkers can always be flooded through the coal scuttles if that be found necessary. As a rule the coal should be removed from the bunker after it has once fired. The facility of removal depends on the location of the bunker and the total amount of coal on hand. With the extensive water-tight sub-division now carried out, and the inevitable restrictions on design in war vessels, we are not aware that any change could be made to facilitate the emptying of bunkers when a fire has occurred.

"The practice of the navy department in using bituminous coal exclusively for the past fifteen years, after a previous extended use of anthracite, is sufficient to show that there are good reasons for preferring bituminous coal, and we give some of them: One. The slower rate of combustion of anthracite with natural draft, thus involving greater weight and space for boilers to give same power. Two. Greater cost of anthracite than bituminous. Three. Practical impossibility of procuring anthracite except on our own Atlantic coast, so that bituminous coal would have to be used everywhere else. Four. Greater difficulty in firing anthracite than bituminous. It thus appears that anthracite is, on the whole, distinctly inferior to bituminous for naval use except in the freedom from spontaneous ignition and the comparative rarity of this phenomenon on our ships shows that we could not for a moment allow this advantage to outweigh the numerous and important disadvantages."



## UNITED STATES LIGHT-HOUSE SERVICE.

ANNUAL REPORT OF THE LIGHT-HOUSE BOARD AFFORDS TANGIBLE EVIDENCE OF THE DEGREE OF EFFICIENCY TO WHICH THE SERVICE HAS BEEN BROUGHT.

The annual report of the United States light-house board, which has just come from press, contains an interesting compilation of statistics affording further proof of the fact that no country on earth is comparable with the United States in the elaborateness of its aids to navigation. At the close of the year there were under the control of the light-house establishment the following named aids to navigation: Light-houses and beacon lights, 1,179; light-vessels in position, 44; light-vessels for relief, 6; electric-lighted buoys in position, 11; gas-lighted buoys in position, 55; fog signals operated by steam, caloric, or oil engines, 158; fog signals operated by clockwork, 209; post lights, 1,739; day or unlighted beacons, 439; whistling buoys in position, 70; bell buoys in position, 116; other buoys in position, including pile buoys and stakes in fifth district and buoys in Alaskan waters, 4,707.

In the construction, care, and maintenance of these aids to navigation there were employed: Steam tenders, 31; steam launches, 11; sailing tenders, 2; light keepers, 1,339; other employees, including crews of light-ships and tenders, 1,226; laborers in charge of post lights, 1,356.

The aids to navigation maintained by the light-house board in various sections of the country are as follows:

AIDS.	Atlantic coast.	Pacific coast.	Lake coast.	Western rivers.	Total entire coast, 1898.
Electric lights.....	5				5
First-order lights.....	40	15			55
Second-order lights.....	15	1	3		19
Third-order lights.....	30	5	23		58
Three-and-a-half-order lights.....	8		8		11
Fourth-order lights.....	163	19	93		275
Fifth-order lights.....	112	7	36		155
Sixth-order lights.....	59		51		110
Lens lanterns.....	94	19	76		189
Range lenses.....	16				16
Reflectors.....	49		4		53
Tubular and other lanterns.....	379	112	107	1,415	2,013
Light-vessels in position.....	30	3	11		44
Electric-lighted buoys.....	11				11
Gas-lighted buoys.....	26		29		55
<b>Total lighted aids.....</b>	<b>1,032</b>	<b>184</b>	<b>441</b>	<b>1,415</b>	<b>3,072</b>
Fog signals operated by steam, hot air, or oil engines.....	60	29	69		158
Fog signals operated by clockwork.....	179	13	17		209
Day beacons.....	335	98	1	5	439
Whistling buoys.....	50	20			70
Bell buoys.....	98	14	4		116
Other buoys.....	3,749	339	619		4,707
<b>Total unlighted aids.....</b>	<b>4,471</b>	<b>513</b>	<b>709</b>	<b>5</b>	<b>5,699</b>
<b>Total number of aids.....</b>	<b>5,503</b>	<b>697</b>	<b>1,150</b>	<b>1,420</b>	<b>8,771</b>

An idea of the cost of maintenance of this service may be gained from the following statement of appropriations for a single year, which has no reference to the regular heavy annual expenditures for extensions and improvements, and which does not include the salaries of army and navy officers in charge of the service: Supplies for light-houses, \$425,000; repairs for light-houses, \$600,000; salaries of light keepers, \$720,000; expenses of light-vessels, \$350,000; expenses of buoyage, \$550,000; expenses of fog signals, \$110,000; lighting of rivers, \$300,000; surveys of light-house sites, \$1,000; oil houses for light-stations, \$5,000.

## CHICAGO GRAIN FREIGHT SITUATION.

Chicago, Ill., March 9.—The freight situation remains unchanged, but inasmuch as shippers are not disposed to bid up the 3-cent corn rate storage and Buffalo delivery, and as receipts are dropping off to some extent, some of the vessel men are inclined to feel a little anxious. Following is an extract from a letter of advice sent out yesterday by one of the Chicago vessel agencies to an owner who has been holding off on the charter of a couple of vessels that have been here all winter:

"No charters have been made that would tend to make us feel weak on the situation, and still we fear there is a possibility of your holding off too long. We notice some anxiety on the part of the line-boat people, and we fear that before long they may turn in and accept 3-cent business. You will also understand that the shipper claims ability from his standpoint to carry the grain as cheaply as a 3¼-cent lake freight basis. They pay for each ten days ¼ cent storage. Figuring forty days from this time until the opening of navigation, and we have 1 cent storage; add insurance, ½ cent, and say the opening rate of freight is 1½ cents, and we have all told 3 cents. Shippers claim they cannot do much worse than this by holding off. These figures are what causes them to refuse vessels at 3¼ cents. There is no Lake Ontario demand just now but business in that direction will undoubtedly develop very strong about the opening."

A model of the Chicago drainage canal is to be exhibited at the coming Paris exposition, by resolution of the engineering committee of the trustees of the Sanitary District of Chicago. The model, it is stated, will be 40 feet long on a scale of 10 inches to one mile, and the cost is estimated at \$3,000. Chief Engineer Isham Randolph and a committee of three trustees will decide upon the details.

## A TWIN-SCREW PASSENGER STEAMER.

VICE PRESIDENT MORTON F. PLANT OF THE PLANT SYSTEM PLACES THE CONTRACT FOR ONE WITH THE WM. CRAMP & SONS CO.

The Plant system, which operates nearly 2,000 miles of railroad and over 3,000 miles of steamship service, and owns eight of the winter resort hotels of Florida, has just closed a contract, by Mr. Morton F. Plant, vice-president, with the William Cramp & Sons Ship & Engine Building Co. of Philadelphia for a twin-screw passenger and cargo steamship, the characteristic features of which are such as to place her in the first rank of her class. The vessel is intended for coastwise traffic and is designed to have on a draught of only 18 feet, a cargo capacity of 3,800 tons measurement, and to attain with cargo a speed of 18 knots. This speed is no mere estimated or hoped for attainment, but is guaranteed on a long distance loaded trial of a very complete character, much more thorough indeed than government tests, inasmuch as it comprises a requirement of performance on a fixed total quantity of coal. These results are looked forward to with confidence by builders and designers, the latter being Mr. Reginald P. Bolton, M. E. of New York, who has been aided by Mr. E. J. Moynihan, his associate.

Dimensions of this new steamer are: Length between perpendiculars, 400 feet; beam, 50 feet; moulded depth, 36½ feet; making her one of the largest of her class. The hull will be provided with double bottom, and will be divided into nine compartments by eight water tight bulkheads carried without any openings up to the underside of the main deck. One of these bulkheads divides the boiler room and coal bunkers into two parts, thus reducing the risk of crippling the steam power. Bilge keels of unusual proportions, and a fender for docking, are provided. This vessel will of course be classified as an auxiliary cruiser and will enter a trial for classification under the provisions of the postal subsidy act.

Accommodations of a liberal character are provided for 350 first-class and for 100 second-class passengers. These include 100 staterooms 8 feet deep, opening out on the upper decks. All the first-class accommodations are above the main deck. A handsome saloon to seat 140 persons is on the upper deck, with a ladies' saloon, and a smoking room forward, with the purser's office conveniently accessible; also toilets readily reached, and all under cover. The saloons are lighted and ventilated by a central trunk skylight, 7 feet wide. In the saloon a novel feature will be separate tables for parties of four, and in the music room a grand piano will be placed, enabling a singer to face the audience. The upper deck affords a sheltered promenade the full length of the ship of not less than 8 feet width on each quarter, and the awning deck above is 340 feet in length and of not less than 10 feet width, with an extension forward around the foremast, affording to passengers a clear view ahead. On this deck the boats are usually placed, but in this new vessel they will be overhead, and some improvements in arrangements for launching will add to the security of passengers. The engine and boiler room casings are carried up above this deck to the bridge head, as well as the galley vent, thus freeing passengers from the smells incident to the location of such vents on deck. There are two bridges, one forward and one aft, with two systems of steering, whereby this large vessel can be maneuvered in and out of troublesome channels. Much attention has been directed to the sanitary appliances, which are probably more elaborate than anything heretofore afforded. Each range of staterooms has respective toilets, situated at the stairways, and thus readily accessible, and at the same time situated vertically over each other on their respective decks. Bath rooms are provided and can be connected with certain of the staterooms for the use of invalids, for whom specially large and airy rooms have been provided. Separate systems of conveniences exist for each class of labor required in the operation of the ship, such as firemen, waiters, oilers and cooks; also for second-class passengers and crew. The cooking and pantry arrangements are very complete, and are designed to reduce the labor involved. The galley and pantries are below the saloon; the materials being delivered by four dumb-waiters. The galley is ventilated up the boiler room casing, and is fitted with appliances for refrigerating, cooking and cleaning. The store rooms and mess rooms are all arranged in close proximity.

Arrangements for rapid handling of cargo comprise five elevators reached by side ports, and a quick-acting winch at forward hatch. Coaling will be effected by newly designed apparatus capable of coaling the ship within two hours, a task worthy of note, as she carries five days' supply for full speed of 18 knots, or nine days' supply at reduced speed. Ashes and garbage are dumped directly overboard. A large mail room is provided, with mail doors, starboard and port, and with apparatus to deliver and receive mail bags to and from small boats. The vessel will be propelled by twin-screws operated by triple expansion four-cylinder engines. She is to be fitted with two pole masts, carrying leg-of-mutton sails and staysails, and will have two funnels.

Maj. J. H. Willard, corps of United States engineers, stationed at Vicksburg, Miss., has advertised for sealed proposals for excavating 7,500,000 cubic yards of earth for diverging the mouth of the Yazoo river. The improvement has been authorized by congress under continuous contract. There is now available for expenditure on this work the sum of \$512,000. Borings made along the line of the main cut show that the material generally is without cohesion and of a character easily removed by hydraulic dredging.

The new Turbinia of 220 feet length and 330 tons displacement is in an advanced stage of construction at Elswick, England, and hopes are entertained of her being tried in two months from the present time. The modifications found to be desirable after the exhaustive trials of her predecessors are considerable. The new vessel has eight propellers on four shafts, instead of the original Turbinia's three shafts and nine propellers. Her "going astern" arrangements are far in advance of those of the pioneer boat.

In answer to an inquiry sent out by the British admiralty a few years ago to ascertain the warship building facilities of Great Britain, it was found that the whole British navy, about 1,500,000 tons, could be duplicated in two years' time.



## GRAIN BILL OF LADING—Continued from page 11.

upon this were, of course, questions as to what constitutes unreasonable delay, what can be done to remove causes of delay, etc.? The entire morning was given up to discussing this feature of the problem. The conference agreed to the proposition that when vessels were unreasonably delayed they should be compensated, leaving it to the vessel owners to prove in any general settlement that might be reached that unreasonable delays had occurred, and leaving open also the question of compensation for such delay. But when another proposition regarding shortage, which was also intended simply for discussion, was brought up, it was voted down, indicating that the grain men were determined to continue the present shortage clause but were disposed to do something towards overcoming delays. The shortage proposition, which was voted down, was as follows: "Lake vessels are not responsible and should not be held liable for apparent shortages that do not represent actual loss, but are mere differences in weights at places of loading or unloading." It was evident that nothing new in the direction of a settlement could be expected from the general meeting, and it was therefore decided to appoint a committee of one representative from the various grain interests to deal with members of the vessel owners' grain bill of lading committee. The committee thus appointed was as follows: Buffalo elevators, E. Michael; Duluth grain shippers and elevators, Geo. Spencer; Chicago grain shippers and elevators, H. H. Peters; Toledo grain shippers and elevators, Mr. Paddock; trunk lines, Mr. Frank Harriott; New York grain trade, Otto E. Lohrke; Philadelphia, Lincoln K. Passmore; Buffalo grain interests, Frank Truscott.

This committee worked on the same ground, with only the one conclusion, that the grain interests were willing to do what they could toward remedying the matter of delays, but would consent to no change in the present shortage clause. It was agreed to take another day to committee work, but with indications of other meetings being required later on if anything is to be accomplished, and only a slight hope of the vessel owner securing much in the way of removal of disadvantages from his standpoint in the grain trade unless his organization feels strong enough to stand out for the programme outlined at the last meeting in Detroit.

## APPOINTMENT OF MASTERS AND ENGINEERS.

Western Transit Co., Buffalo: Steamers—ARABIA, Capt. John Davis, Engineer Frank Miller; BUFFALO, Capt. Edward Roberts, Engineer Wm. McNulty; BOSTON, Capt. S. R. Jones, Engineer Patrick Welch; CHICAGO, Capt. F. J. McCabe, Engineer Wm. Tibby; COM-MODORE, Capt. Thos. Slattry, Engineer James Brooks; HUDSON, Capt. A. J. McDonald, Engineer Moses Tronton; MOHAWK, Capt. Robt. Murray, Engineer M. J. Laney; SYRACUSE, Capt. John Fisher, Engineer John Mark; MONTANA, Capt. Henry Murphy, Engineer James Walker; TROY, Capt. Donald Gillies, Engineer Henry Hess; VANDER-BILT, Capt. F. D. Osborn, Engineer Fred Hale; MILWAUKEE, Capt. F. Folan, Engineer John Raney.

Calvin & Co., Garden Island, Ont.: Steamers—D. D. CALVIN, Capt. A. H. Malone, Engineer T. C. Smith; BOTHNIA, Capt. G. A. Brian, Engineer R. Veech; ARMENIA, Capt. Chas. Coons, Engineer W. Cunningham; REGINALD, Capt. John Doyle, Engineer J. Kennedy; CHIEFTAIN, Capt. John Sullivan, Engineer T. Gray; PARTHIA, Capt. David Lefavre, Engineer G. Sauve; W. JOHNSTON, Capt. Ed. Phelix, Engineer T. Harper; BLUCHELL, Capt. John Dix, Engineer C. LeRiche. Schooners—CEYLON, Capt. H. Smith; AUGUSTUS, Capt. J. Achee; VALENCIA, Capt. J. Ferguson.

Smith, Thomas H., Sturgeon Bay, Wis.: Steamers—JOS. L. HURD, Capt. John Walker, Engineer Geo. Keister; I. N. FOOTE, Capt. C. B. Packard, Engineer James Curry; PEWAUKEE, Capt. Sam Christerfor-son, Engineer N. Tolman. Schooners—EMERALD, Capt. Andrew Ol-son; EVALINE, Capt. John Campbell. Tugs—JOHN LEATHEM, Capt. Henry Tufts, Engineer Ed. Webber; SYDNEY T. SMITH, Capt. Peet Batcheller, Engineer Chas. Vandrasek; GEO. NELSON, Capt. James Tufts, Engineer —; A. J. WRIGHT, Capt. Tom Isabell, En- gineer —.

Dulac, Wm., Mt. Clemens, Mich.: Steamers—F. R. BUELL, Capt. C. W. Woodgrift, Engineer John Deihl; CANISTEO, Capt. Ed. Hen- dricks, Engineer —; A. WESTON, Capt. D. McKinzie, Engineer Ed. Cottrell; CHAS. A. STREET, Capt. T. J. Carlisle, Engineer Wm. Ho- gan. Schooners—J. B. LOZEN, Capt. Ed. Moore; J. GODFREY, Capt. J. B. Lozen; S. B. POMEROY, Capt. W. H. Campau; A. STEWART, Capt. N. Furton; Eleanor, Capt. Frank Dubay; JENNETTE, Capt. Wm. Dubay; ELVINA, Capt. F. Laforge; FULTON, Capt. Eli Furton.

Sicken, M., Marine City, Mich.: Steamers—GEORGE KING, Capt. Wm. Burns, Engineer M. Owen; S. K. MARTIN, Capt. Chas. Kobel, Engineer Frank Oullette; M. SICKEN, Capt. John Kuhn, Engineer Wm. Sicken. Schooners—TEUTONIA, Capt. H. Lawrence; THOS. GAWN, Capt. J. Lawrence; GRACE WHITNEY, Capt. John Lorenzen; MEL- VINA, Capt. H. Larsen; C. SPADEMAN, Capt. G. Goullett; LEVI RAWSON, Capt. James Kobel; ST. JOSEPH, Capt. —; E. J. McVEA, Capt. J. Chartrand.

Ogdensburg Transit Co., Ogdensburg, N. Y.: Steamers—GOV. SMITH, Capt. W. S. Shoy, Engineer John Phillips; JAS. LANGDON, Capt. H. Brown, Engineer D. Costello; A. McVITTIE, Capt. W. H. Williams, Engineer A. D. Houghton; F. H. PRINCE, Capt. D. A. Kiah, Engineer James Chestnut; WALTER L. FROST, Capt. T. M. Hough, Engineer L. D. Willox; WM. A. HASKELL, Capt. E. B. Shay, En- gineer Morris Gore; W. J. PARNELL, Capt. W. D. Waite, Engineer John Alexander.

Whitney, D., Jr., Detroit: Steamer—E. W. OGLEBAY, Capt. W. H. Hutcheson, Engineer Ed. Egan; MERIDA, Capt. John Ivers, En- gineer Jas. Balfour; MECOSTA, Capt. A. C. May, Engineer Geo. Fran- comb; LANSING, Capt. Chas. Miner, Engineer Jos. Coveyeau; D. C. WHITNEY, Capt. Thos. Brady, Engineer Chas. Murett; NIPIGON, Capt. Ed. July, Engineer Chas. Francomb. Schooners—ASHLAND, Capt. Geo. Dennis; MELBOURNE, Capt. Geo. Cooper.

Brittain, R. C., Saugatuck, Mich.: Steamers—FRANK WOODS, Capt. —, Engineer F. Minear; O. E. PARKS, Capt. O. E. Parks,

Engineer F. D. Redner; CHAS. McVEA, Capt. C. B. Coates, Engineer Henry Bender; MAE MARTEL, Capt. L. B. Upham, Engineer Porter; J. C. SUIIT, Capt. J. Roda, Engineer, S. Johns; H. A. ROOT, Capt. W. G. I helps, Engineer —; J. S. CROUSE, Capt. John Snay, Engineer Edward Loun.

Champlain Trans. Co., Burlington, Vt.: Steamers—VERMONT, Capt. Richard Arbuckle, Engineer Jos. Patneade; CHATEAUGAY, Capt. E. J. Baldwin, Engineer Edward Peria; MAQUAM, Capt. F. J. Hawley, Engineer William Young; HORICAN, Capt. E. S. Harris, En- gineer Julius Pereault; TICONDEROGA, Capt. F. G. White, Engineer A. Biganisse; MOHICAN, Capt. Wm. Finkle, Engineer Henry Peria.

North Shore Nav. Co., Collingwood, Ont.: Steamers—CITY OF COLLINGWOOD, Capt. W. J. Bassett, Engineer Chas. Robertson; CITY OF MIDLAND, Capt. F. X. La France, Engineer Wm. Whippis; CITY OF TORONTO, Capt. John O'Donnell, Engineer D. McQuade; CITY OF PARRY SOUND, Capt. Ernest Walton, Engineer J. L. Smith; CITY OF LONDON, Capt. W. W. Storey, Engineer Jas. Crossland.

Smith, Edward, Buffalo: Steamers—THOS. CRANAGE, Capt. John S. McNeil, Engineer E. W. Lafraine; CITY OF VENICE, Capt. Chas. Ainsworth, Engineer A. McLachlan; CITY OF PARIS, Capt. E. D. Ballentine, Engineer G. McLachlan; SAMOA, Capt. John Isbister, En- gineer L. Walpole; SAMUEL MARSHALL, Capt. August Jean, En- gineer B. Leitch. Schooner—SAMUEL J. TILDEN, Capt. John Burke.

Minneapolis, St. Paul & Buffalo S. S. Co., Buffalo: Steamers—MINNEAPOLIS, Capt. William Jamieson, Engineer Bion St. Bernard; ST. PAUL, Capt. James Jackson, Engineer John Davidson; HENNE- PIN, Capt. A. E. McGregor, Engineer Geo. Robinson; NEBRASKA, Capt. Peter Thompson, Engineer Joseph Taylor; JOHN PRIDGEON, JR., Capt. D. N. Sherwood, Engineer John Mogan.

Lake Superior Iron Co., Cleveland: Steamers—LA SALLE, Capt. Wm. Ames, Engineer Frank Steadley; JOLIET, Capt. Chas. Hinslea, Engineer F. B. Smith; WAWATAM, Capt. Edward Mooney, Engineer A. E. Bury; GRIFFIN, Capt. Henry Peterson, Engineer Martin Mitchell; ANDASTE, Capt. Emil Detlefs, Engineer Wm. H. Kennedy; CHOC- TAW, Capt. Benson Fox, Engineer C. E. Walsh.

Bielman, C. F., Manager of river passenger steamers, Detroit: Steamers—GREYHOUND, Capt. B. S. Baker, Engineer Robt. Medler; CITY OF TOLEDO, Capt. Archie Fletcher, Engineer —; DARIUS COLE, Capt. John Robertson, Engineer Wm. Dubois; ARUNDELL, Capt. John Stover, Engineer C. H. McCarter; IDLEWILD, Capt. Jos. Lockeridge, Engineer R. Maxwell.

Booth Packing Co., A. W. Vernon Booth, Managing Owner, Chi- cago: Steamers—H. R. DIXON, Capt. J. F. Hector, Engineer J. E. Evans; HUNTER, Capt. E. C. Smith, Engineer Geo. Belloir; R. B. BARKER, Capt. J. Clow, Engineer Geo. Cook; T. H. CAMP, Capt. John Swanas, Engineer Geo. McNeil; R. A. ANDERSON, Capt. Tom Hadland, Engineer C. A. Briggs.

Vance & Co., Milwaukee, Wis.: Steamers—R. P. FLOWER, Capt. F. W. Van Patten, Engineer Daniel Darcey; F. L. VANCE, Capt. E. B. Marquette, Engineer J. R. Mason; F. SCHLESINGER, Capt. D. P. Craine, Engineer A. B. Fortier; MARYLAND, Capt. J. E. Yax, En- gineer M. Conley; MANCHESTER, Capt. T. Kelley, Engineer James Grant. Schooner—METACOMET, Capt. —.

Chicago Fire Dept., Chicago: Steamers—ILLINOIS, Capt. James F. Nolan, Engineer Daniel F. Rice; GEYSER, Capt. Wm. H. Moore, Engineer Robert F. Nicholson; YOSEMITE, Capt. John W. Nolan, Engineer Charles Waters; FIRE QUEEN, Capt. Lewis A. Brockway, Engineer William H. Kearney; CHICAGO, Capt. —, Engineer Frank B. Hutchinson.

North Western Transportation Co., Detroit: Steamers—H. H. BROWN, Capt. D. Girardin, Engineer Jno. H. Hand; FAYETTE BROWN, Capt. Jos. A. Powell, Engineer Nicklas Anderson; S. R. KIRBY, Capt. Jno. F. Jones, Engineer Wm. Watts; E. M. PECK, Capt. A. C. Callam, Engineer Wm. Brake. Schooner—G. E. HARTNELL, Capt. C. L. Allen.

Flint & Pere Marquette R. R. Line, Ludington, Mich.: Steamers—F. & P. M. No. 2, Capt. R. Haslebarth, Engineer Geo. Depuy; F. & P. M. No. 3, Capt. F. A. Dority, Engineer H. Nyland; F. & P. M. No. 4, Capt. Jos. Russell, Engineer F. McLaren; F. & P. M. No. 5, Capt. J. J. Doyle, Engineer J. Berry; PERE MARQUETTE, Capt. P. Kilty, Engineer R. McLaren.

Cleveland & Buffalo Transit Co., Cleveland: Steamers—CITY OF ERIE, Capt. John Edwards, Engineer J. G. Rendall; CITY OF BUF- FALO, Capt. W. H. Smith, Engineer Charles Lorimer; STATE OF OHIO, Capt. W. J. Willoughby, Engineer David Donaldson; STATE OF NEW YORK, Capt. H. McAlpin, Engineer W. H. Steen.

Matthew's Line, Toronto, Ont.: Steamers—NIAGARA, Capt. Jas. Morgan, Engineer Thos. Mills; CLINTON, Capt. John Fahey, Engineer J. M. Donaldson. Schooners—EMERALD, Capt. John Joyce; CLARA YOEUELL, Capt. —; LISGAR, Capt. R. Fallman; GRIMSBY, Capt. Hy. Brooks; RAPID CITY, Capt. J. Blower.

Republic Iron Co., Cleveland, O.: Steamers—REPUBLIC, Capt. E. T. Rattray, Engineer John W. Lowe; SPECULAR, Capt. Wm. Me- garvey, Engineer John Smith; CONTINENTAL, Capt. Harry Rogers, Engineer McGregor. Schooners—MAGNETIC, Capt. W. A. Black; GRACE HOLLAND, Capt. B. M. Landfair.

Runnels, H. E., Port Huron, Mich.: Steamers—MAGGIE DUN- CAN, Capt. D. M. Sinclair, Engineer Irving Buzard; O. O. CARPEN- TER, Capt. J. E. Rathbun, Engineer J. C. Watson. Schooners—FAVOR- ITE, Capt. L. Sinclair; CONSTITUTION, Capt. E. R. Tousley; E. E. TYSON, Capt. C. W. Annis.

Lake Michigan & Lake Superior Trans. Co., Chicago: Steamers—MANITOU, Capt. Allan McIntyre, Engineer R. L. Peck; PEERLESS, Capt. H. C. Page, Engineer John R. Bennett; CITY OF TRAVERSE, Capt. J. M. Twitchell, Engineer Ed. Meech; JAY GOULD, Capt. Chas. Wilson, Engineer D. H. Robertson.

Stevenson, John, Detroit: Steamers—MIAMI, Capt. H. Huyser, En- gineer John Elsey; S. H. STARKE, Capt. Wm. Crosby, Engineer John



Loeg; JOHN H. PAULY, Capt. Geo. Ferguson, Engineer M. O. Roach; BESSIE, Capt. Wm. J. Joork, Engineer J. Bugner; HATTIE, Capt. Nat Stewart, Engineer —.

Williams Trans. Co., H. W., South Haven, Mich.: Steamers—H. W. WILLIAMS, Capt. Frank Swails, Engineer Perry Kuaggs; CITY OF KALAMAZOO, Capt. David Morris, Engineer Chas. La Bounty; GLENN, Capt. —, Engineer Ralph Peterson; LORAIN L., Capt. —, Engineer —.

Graham & Morton Trans. Co., Chicago: Steamers—CITY OF CHICAGO, Capt. Chas. McIntosh, Engineer W. J. McClure; CITY OF MILWAUKEE, Capt. John Stewart, Engineer C. L. Barron; CITY OF LOUISVILLE, Capt. William A. Boswell, Engineer Wm. Johnson.

Milwaukee Tug Boat Line, Milwaukee, Wis.: Steamers—HELENA, Capt. Jas. Leisk, Engineer Scott Pratt; NEOSHO, Capt. Wm. Wright, Engineer John McCaffrey; VERONICA, Capt. O. J. Soleau, Engineer W. J. Riordan. Schooner—AMBOY, Capt. W. R. Williams.

Vulcan Transportation Co., James Findlater, Secretary, Detroit: Steamers—FOREST CITY, Capt. Joseph Sanders, Engineer Louis N. Peck; R. J. HACKETT, Capt. Thos. H. Sanders, Engineer William McKittrick. Schooner—WM. MCGREGOR, Capt. Alex. Glen.

Comstock, A. W., Alpena, Mich.: Steamer—SIMON LANGELL, Capt. M. A. Budd, Engineer R. Cameron. Schooners—ARENAC, Capt. Wm. L. Hornig; W. K. MOORE, Capt. B. Warwick; INTERLAKEN, Capt. Chas. Adams; ABRAM SMITH, Capt. D. A. Kendall.

Olga Trans. Co., E. G. Reisterer, Mgr., Tonawanda, N. Y.: Steamer—JOHN C. PRINGLE, Capt. T. R. Forton, Engineer J. N. Burns. Schooners—SWEETHEART, Capt. C. F. Kellar; BEN HARRISON, Capt. C. C. Hanly; UNADILLA, Capt. Fredk. Hepner.

Canadian Pacific Steamship Co., Montreal, Canada: Steamers—MANITOBA, Capt. E. B. Anderson, Engineer W. Lewis; ATHABASCA, Capt. G. McDougall, Engineer W. Lockerbie; ALBERTA, Capt. J. McAllister, Engineer Angus Cameron.

Hope Transportation Co., John A. Francombe, Mgr., Detroit: Steamer—W. R. STAFFORD, Capt. A. P. Gallino, Engineer Jno. A. Francombe. Schooners—ED. MCWILLIAMS, Capt. Geo. Johnson; JNO. A. FRANCOMBE, Capt. Jno. Mason.

Parker, G. W., Marine City, Mich.: Steamer—D. F. ROSE, Capt. C. M. Saph, Engineer Hubert Mamon. Schooners—BUCKEYE STATE, Capt. Wm. D. Angel; BOSCOBEL, Capt. Andrew J. Young, Jr.; MARINE CITY, Capt. Andrew J. Young, Sr.

Owen, J. Emory, Trans. Co., R. T. Gray, Mgr., Detroit: Steamers—JOHN OWEN, Capt. E. F. Thorp, Engineer S. L. Phillips; J. EMORY OWEN, Capt. F. C. Hart, Engineer Thos. McDonough. Schooner—MICHIGAN, Capt. Fred L. Chalcraft.

Michigan Fruit Line Steamers, Saugatuck, Mich.: Steamers—SAUGATUCK, Capt. John Campbell, Engineer William Bradley; CHAS. McVEA, Capt. Chas. Coates, Engineer Henry Bender; BON AMI, Capt. Wm. Turnbull, Engineer Henry Randall.

Sands, Louis, Manistee, Mich.: Steamer—MAGGIE MARSHALL, Capt. August E. Anderson, Engineer —. Schooners—ISABELLA SANDS, Capt. August Johnson; ARENDAL, Capt. Anton Erickson; A. W. LUCKEY, Capt. J. L. Jensen.

Owen, Geo., Ashtabula, O.: Steamers—JANIE E. SMITH, Capt. Frank E. Nettleton, Engineer Henry Hess; L. W. KNAPP, Capt. Aloah Snell, Engineer Peter Rasmussen; NEAL H. DOW, Capt. Clyde Jones, Engineer —.

Teagan Bros., Detroit: Steamers—CHAUNCEY HURLBUT, Capt. J. B. Maddock, Engineer J. C. Bennett; H. S. PICKANDS, Capt. John C. Maddock, Engineer Wm. Westbrooke. Schooner—D. K. CLINT, Capt. B. Peltier.

St. Lawrence & Chicago Steam Navigation Co., Ltd., J. H. G. Hagerty, Mgr., Toronto, Ont.: ALGONQUIN, Capt. James McMaugh, Engineer James H. Ellis; ROSEDALE, Capt. James Ewart, Engineer Ed. O'Dell.

Rhodes, R. R., Cleveland: Steamers—YALE, Capt. John Coulter, Engineer Harry Stone; NESHOTO, Capt. P. Dowdell, Engineer Henry Stone; R. R. RHODES, Capt. Washington Moore, Engineer —.

Jenkins, John, Marine City, Mich.: Steamer—W. H. SAWYER, Capt. John Jenkins, Engineer Nelson Gulette. Schooners—A. C. TUXBURY, Capt. J. C. Angell; C. E. REDFERN, Capt. Wyman Powers.

Michigan Wrecking & Salvage Co., Detroit, Mich.: Steamer—OGE-MAW, Capt. Martin O'Toole, Engineer Walter Harling. Tug—HENRY W. JOHNSON, Capt. Daniel McFarlane, Engineer Charles Draper.

Rice, W. E., Port Huron, Mich.: Steamer—RHODA STEWART, Capt. Wm. J. Cowles, Engineer Jas. A. Southgate. Schooner—WM. BRAKE, Capt. Fred Kirker; MAGNET, Capt. Geo. J. Bennett.

McLain, S. R., Toledo, O.: Steamer—S. C. BALDWIN, Capt. J. A. Maddigan, Engineer Joseph Hall. Schooners—A. A. CARPENTER, Capt. W. K. Fullum; MARIAN BUTMAN, Capt. John Bell.

Lake Ontario & Bay of Quinte Steamboat Co., Kingston, Ont.: Steamers—HERO, Capt. Wm. Bloomfield, Engineer Robt. McEwan; NORTH KING, Capt. John Jarrell, Engineer O. J. Hickey.

Bigelow Bros., Chicago: Steamer—MADAGASCAR, Capt. John Jenks, Engineer Charles Nerreter. Schooners—S. M. STEPHENSON, Capt. John Cowan; FANNY NEIL, Capt. C. K. Moore.

Candler, H. & J., J. W. Candler, Managing Owner, Detroit: Steamer—M. M. DRAKE, Capt. P. C. Bassett, Engineer Cris Muykelbury. Schooner—SENATOR, Capt. Chas. Anderson.

Merchant's Line, G. E. Jacques & Co., Montreal: Propellers—CUBA, Capt. Henry Chestnut, Engineer William Kennedy; MELBOURNE, Capt. Fred Elliott, Engineer Thos. Milne.

McVittie, Alex., Detroit Dry Dock Co., Detroit: Steamers—SENATOR, Capt. E. B. McQueen, Engineer Andrew Carter; JOHN F. EDDY, Capt. James Mara, Engineer A. C. Bowen.

McLachlan Trans. Co., Port Huron, Mich.: Steamer—KITTY M.

FORBES, Capt. J. W. Montgomery, Engineer Robert Dorn. Schooner—MARY E. McLACHLAN, Capt. Geo. B. Fuller.

Morley, C. T., Managing Owner, Marine City, Mich.: Steamers—W. B. MORLEY, Capt. J. A. Nicolson, Engineer P. Caniff; J. J. HILL, Capt. W. S. McLean, Engineer Wallace Lockhart.

Spry Lumber Co., John C. Spry, Managing Owner, Chicago, Ill.: Steamer—JOHN SPRY, Capt. Frank Elliott, Engineer John Dechane. Schooner—J. T. JOHNSTON, Capt. John Trudo.

Hurson Transportation Co., Milwaukee, Wis.: Steamers—F. & P. M. No. 1, Capt. A. F. Pitman, Engineer E. B. Pike; CITY OF TRAVERSE, Capt. E. C. Evans, Engineer C. E. Grobben.

North West Trans. Co., Sarnia, Ont.: Steamers—UNITED EMPIRE, Capt. Jno. McNab, Engineer S. Brisbin; MONARCH, Capt. E. Robertson, Engineer E. W. McKean.

The Thomson Line, St. Clair, Mich.: Steamers—DOUGLASS, Capt. F. J. Meno, Engineer Jos. Meno; PILGRIM, Capt. E. Hayward, Engineer Porter Robertson.

United States & Ontario Steamship Nav. Co., A. C. Huidekoper, Mgr., Conneaut, O.: Steamer, SHENANGO NO. 1, Capt. R. R. McLeod, Engineer Geo. Collinge.

Charlevoix Lumber Co., Charlevoix, Mich.: Steamer—PINE LAKE, Capt. Eph. S. Small, Engineer Jno. Chemock. Schooner—NAJAD, Capt. Christ Edwardson.

Ashley & Dustin, Detroit, Mich.: Steamers—FRANK E. KIRBY, Capt. A. J. Fox, Engineer E. Perry; WYANDOTTE, Capt. —, Engineer J. Holder.

Haynes, F. J., Port Huron, Mich.: Schooners—ANDREW JACKSON, Capt. David Gleason; CHARLIE CRAWFORD, Capt. Allen Curtis.

Eagle Trans. Co., S. Langell, Mgr., St. Clair, Mich.: Steamer—OSCAR FLINT, Capt. Richard O'Connor, Engineer J. P. Merrill.

Butteroni, Kate, Marine City, Mich.: Steamer—KATE BUTTERONI, Capt. C. E. Norton, Engineer S. C. Bennett.

Hopkins Steamship Co., St. Clair, Mich.: Steamer—CENTURION, Capt. David Hutcheson, Engineer Thos. Welch.

Myles' Sons, Thomas, Hamilton, Ont.: Steamer—MYLES, Capt. John S. Moore, Engineer James Smeaton.

Loutit, W. H., Grand Haven, Mich.: Steamer—PENTLAND, Capt. Thos. McCambridge, Engineer C. Ball.

Calbick & Co., J. A., Chicago: Steamer—KALKASKA, Capt. Henry S. Shackett, Engineer A. W. Wilcox.

Alger, Smith & Co., Detroit: Steamer—GETTYSBURG, Capt. S. H. Currie, Engineer W. P. Wenner.

Roby Trans. Co., Detroit: Steamer—L. C. WALDO, Capt. John Duddleson, Engineer N. E. Allen.

Dunham, J. S., Chicago: Steamer—CITY OF LONDON, Capt. Wm. Anderson, Engineer J. J. Staley.

Blodgett, Wm. C., Buffalo: Steamer—ST. JOSEPH, Capt. Geo. E. Talbott, Engineer J. A. Braman.

Chesebrough Bros., Bay City, Mich.: Steamer—PESHTIGO, Capt. Chas. Haight, Engineer —.

Sylvester Bros., Toronto, Ont.: Schooner—ST. LOUIS, Capt. George Williamson.

McCormick, H. W., Bay City, Mich.: Schooner—ONEONTA, Capt. M. J. Shean.

Mason, L. P., Saginaw, Mich.: Schooner—ROSA SONSMITH, Capt. C. Sonsmith.

Durand, Homer, Toledo, O.: Schooner—P. B. LOCKE, Capt. H. Durand.

#### GRAIN SITUATION IN THE NORTHWEST.

Duluth, Minn., March 7.—Although there is nothing doing in the way of grain freights here as yet, the situation has many elements of strength. The stocks of grain in store at this port March 4 and at the corresponding period a year ago were as follows:

	1899.	1898.
Wheat.....	7,611,307	2,707,426
Barley.....	411,962	551,782
Flax.....	1,083,072	586,676
Oats.....	1,709,827	2,747,387
Rye.....	262,533	1,274,757
Corn.....	4,497,917	2,696,226
	15,576,618	10,564,254

One of the leading vessel agencies says in advices to its customers: "It is altogether likely that before April 1 all available storage space will be consumed. Indeed, one of the five elevator systems at the head of the lakes has announced its inability to receive any more grain. Another system will be full before the end of next week. There is every indication that there is a large quantity of grain in the country elevators and in the farmers' hands, so that we confidently hope to have a fairly good market all through the spring and summer. Freight rates may be said to be on a basis of  $2\frac{1}{4}$  cents, wheat. The inquiry for tonnage, however, is very fragmentary, and is confined entirely to the shippers of coarse grains. The wheat markets are all out of line. The probable controversy over the grain bill of lading also has some effect on the market. The movement of coal from docks continues very active, and as stated in previous advices, there will be a shortage in some grades of anthracite. There is much more ice in the harbor than there was a year ago. The lake is also covered with ice as far as the eye can reach."

Mr. E. D. Trowbridge, who has been connected with long distance telephone service in Cleveland since its introduction here, and who has been unusually successful in his dealings with the shipping interests, on account of thorough business methods, goes to Detroit as superintendent of the long distance department of the Michigan Telephone Co. He certainly takes with him the best wishes of Cleveland vessel men.



# MARINE REVIEW

Devoted to the Merchant Marine, the Navy, Ship Building, and Kindred Interests.

Published every Thursday at No. 418-19 Perry-Payne building, Cleveland, Ohio, by THE MARINE REVIEW PUBLISHING CO.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second-class Mail Matter.

On the same process of reasoning that induced the little boy to say that he supposed people laughed in their sleeves because that was where their funny bones were located, the Review may be pardoned the indulgence of a little subtle amusement at the expense of two or three most highly esteemed contemporaries who are just at present arguing very earnestly the question of the respective merits of forms they have adopted for giving to their patrons advance information relative to new work in American ship yards. These little controversies, which, it seems, started among advertising solicitors, have now grown to the dignity of consideration in the editorial columns of the publications in question, and the Review can but hold up its hands, metaphorically speaking, and cry Gentlemen! Gentlemen! For like youngster's mother who regretted making the jam because of the internal complications which followed, we feel especially grieved that such dire results should follow an action that was taken all innocently enough. As all the leading advertisers in the marine field are already aware of it, we may as well confess gracefully that we are the culprit. It has been several years now since the Review inaugurated the scheme of issuing what we termed "contract sheets," and these little circulars, designed to give our advertising patrons early information relative to the placing of contracts for new vessels, graduated through the successive stages of quarterly, monthly and weekly issuance. Now the idea has been elaborated until special delivery letters, and even telegrams, are frequently sent out from this office to appraise advertisers of the award of contracts placed unexpectedly. Meanwhile some of the contemporaries above referred to paid us the compliment of an adoption of our original idea, and this lamentable little spat, which we now so deeply deplore, seems to have been caused by an argument as to whether a weekly or a bimonthly contract sheet is best. Our readers will appreciate that the Review, having inaugurated in succession the one and the other, feels doubly responsible. It may be admitted, however, that our thought in the matter is not solely an unselfish one. The Review's hopper of advertising novelties, which is indeed seldom idle, is about to give forth a fresh grist, including one pet morsel, which, if the egotism be pardoned, we consider of even greater value than the troublesome contract sheet idea. Yet we are led to seriously fear that if these quarrels relative to the manner of imitation go on, our friends will cease to pay us the compliment of utilizing our ideas at all.

The numerous enthusiasts on the subject of the general efficiency of the bureau officers of the United States navy department will be gratified to learn that under the provisions of the naval personnel law the bureau chiefs of the navy department, who have heretofore been entitled to the relative rank and pay of commodores, will have the relative rank and pay of rear admirals of the second class, corresponding in grade and emoluments to brigadier-generals of the army. The officers affected are Civil Engineer M. T. Endicott, chief of the bureau of yards and docks; Commander Royal B. Bradford, chief of the bureau of equipment, who becomes a captain under the terms of the personnel law; Capt. A. S. Crowninshield, chief of the bureau of navigation; Capt. Charles O'Neil, chief of the bureau of ordnance; Chief Constructor Philip Hichborn, chief of the bureau of construction and repairs; Engineer-in-Chief George W. Melville, chief of the bureau of steam engineering, who, by the personnel law, becomes a captain in the line; Paymaster Gen. Edwin Stewart, chief of the bureau of supplies and accounts, and Surgeon-General William R. Van Reypen, chief of the bureau of medicine and surgery. Chief Constructor Hichborn celebrated his advancement and his sixtieth birthday together.

The final action of the last congress in naval affairs does not constitute a very flattering commentary on the intelligence, not to say good judgment, of that body. In the matter of the proposed increase of the navy, the senate yielded to the house on the number of new vessels, while the house yielded to the senate on the price of armor. We thus have the edifying spectacle of the authorization of twelve new vessels, comprising three battleships, three armored cruisers and six unarmored cruisers, but with an embargo placed upon the making of contracts therefor until armor can be procured at \$300 per ton. In other words no move can be made with reference to new armored vessels, beyond the preparation of the plans, until the next congress provides a legislative remedy for the absurd condition that exists at present. An interesting commentary on the present state of things is that in the matter of the battleships authorized last year congress conceded that \$400 per ton be paid for armor plate.

The United States civil service commission announces examinations on March 17 and 18 for the positions of inspector of hulls and inspector of boilers in the steamboat inspection service. Full particulars may be had by addressing the commissioners at Washington. Commander C. O. Allibone, of the ninth light-house district with headquarters at Chicago, announces that an examination will be held March 30 for the position of vessel master in the light-house service, the district including Lake Michigan, Green bay, and tributary waters lying west of a line drawn across the straits of Mackinac. It is not necessary to apply in person to Commander Allibone.

The secretary of the Canadian department of railways and canals announces that the Welland canal will be opened not later than April 18 and that the St. Lawrence canals will be opened by the 20th of that month.

## THE MAINE—CAPT. CHARLES D. SIGSBEE.

The average naval officer, and the average man who from the standpoint of a ship builder or anything else is interested in the technical side of a war vessel's history, would have been prone to declare, during the past few months, that based upon the very full information compiled by the official board of inquiry, everything possible regarding the Maine disaster had been threshed out. It is surprising, therefore, that Capt. Charles D. Sigsbee, commander of the unfortunate vessel at the time of her destruction, has managed to present a very interesting volume in "The Maine, An Account of Her Destruction in Havana Harbor," which has just come from the press of the Century Co. It may as well be admitted that much of the fascination and something of the interest which Capt. Sigsbee's work possess is due to the fact of it being a "personal narrative" of a man who was the central figure in the incident which precipitated the Spanish-American war, yet at the same time Capt. Sigsbee's faculty for close observation, and his thorough knowledge of naval science, go to make the volume one of interest to the technical mind.

The main body of the story is divided into three chapters, entitled respectively, "Our Reception at Havana," "The Explosion," and "The Wrecking and the Inquiry." Appended to these are a technical description of the Maine; a resume of precautions taken for the safety of the Spanish cruiser Vizcaya during her stay in New York harbor; the full findings of the United States court of inquiry; the message of the President of the United States; Ensign Powelson's personal report to Capt. Sigsbee on the cause of the explosion of the Maine; the finding of the Spanish court of instruction; the names and rates of the members of the Maine's crew, and the burial and identification list of the Maine's dead.

Capt. Sigsbee has not failed to allow the reader another exemplification of the old theory regarding the small things which impress one in moments of supreme danger. He says: "About an hour before the explosion I had completed a report called for by Mr. Theodore Roosevelt, assistant secretary of the navy, on the advisability of continuing to place torpedo tubes on board cruisers and battleships. I then wrote a letter home, in which I struggled to apologize for having carried in my pocket for ten months a letter to my wife from one of her friends of long standing. The cabin mess attendant, James Pinckney, had brought me, about an hour before, a civilian's thin coat, because of the prevailing heat. I had taken off my blouse and was wearing this coat for the only time during the cruise. In the pocket I had found the unopened and undelivered letter. I was inclosing my letter in its envelope when the explosion came. The impression made on different people on board the Maine varied somewhat. To me, in my position, well aft, and within the superstructure, it was a bursting, rending and crashing sound or roar of immense volume, largely metallic in character. It was followed by a succession of heavy ominous, metallic sounds, probably caused by the overturning of the central superstructure and by falling debris. There was a trembling and lurching motion of the vessel, a list to port, and a movement of subsidence. The electric lights, of which there were eight in the cabin where I was sitting, went out. Then there was intense blackness and smoke.

"The situation could not be mistaken; the Maine was blown up and sinking. For a moment the instinct of self-preservation took charge of me, but this was immediately dominated by the habit of command. I went up the inclined deck into the starboard cabin, toward the starboard air ports, which were faintly relieved against the background of the sky. The sashes were out and the openings were large. My first intention was to escape through an air port, but this was finally abandoned in favor of the more dignified way of making an exit through the passageway leading forward through the superstructure. I groped my way through the cabin into the passage, and along the passage to the outer door. The passage turned to the right, or starboard, near the forward part of the superstructure. It was soon necessary to retire from the main deck, for the after part of the ship was sinking rapidly. I then went up on the poop deck. By this time Lieutenant Commander Wainwright and others were near me. Everybody was impressed by the solemnity of the disaster, but there was no excitement apparent; perfect discipline prevailed.

"The question has been asked many times if I believed then that the Maine was blown up from the outside. My answer to this has been that my first order on reaching the deck was to post sentries about the ship. I knew that the Maine had been blown up, and believed that she had been blown up from the outside. Therefore, I ordered a measure which was intended to guard against attack."

Capt. Sigsbee can not be called a brilliant writer, but he has proven himself quite skillful in telling a story that is of sufficient importance in itself to commend it to the attention of the reader. Like the concise reports that established the reputation of the officers of the naval service during the war, his presentation of the whole subject involved is clear and forceful, and he has fortunately not withheld his private opinion in instances where an expression of his personal views is of more interest and value than a statement from any other source. The volume is enriched by a large number of illustrations from photographs and drawings, many of them heretofore unpublished, which cover as fully every phase of the subject as does Capt. Sigsbee's interesting text.

Published by the Century Co., New York City.

The executive committee of the Society of Naval Architects and Marine Engineers invites correspondence as to papers to be read at the seventh annual meeting in November next. In a letter of recent date, the committee says it is necessary for intelligent discussion that papers should be in print thirty days before the meeting, and, therefore, members who desire to submit papers or who have suggestions to make are requested to communicate with the Secretary, Francis T. Bowles, New York, at their earliest convenience. The following resolution was unanimously adopted at the sixth annual meeting: "That papers be invited upon the subject of life saving at sea for the next annual meeting, and that two such papers be selected by the executive committee for publication and discussion." Members are invited to suggest names of persons outside the society who might be asked to prepare papers on this subject.

It is estimated that the damage to the American Mail Steamship Co.'s steamer Admiral Dewey, which recently went ashore on Cuttyhunk Island, will amount to about \$50,000. Many of the plates and frames are broken, indented and twisted.



## JAPANESE BELTED CRUISER.

THE ASAMA, TWELFTH VESSEL BUILT AT ELSWICK-ON-THE-TYNE, ENGLAND, FOR THE IMPERIAL NAVY, PASSES A MOST SUCCESSFUL TRIAL.

The Asama, the latest cruiser built in a British yard for the Imperial Japanese navy, a few days ago underwent a most satisfactory trial. The horse power developed was rather over 13,000, giving 140 to 142 revolutions per minute, and a speed by log averaging 20.37 knots. During the forced draft trials, with a moderate sea but a strong beam wind off the land, the engines, built by Messrs. Humphrys & Tennant, worked up to 19,000 horse power, with 158 revolutions and a mean speed for the vessel of 22.07 knots. There are many points of considerable interest in the Asama. Both engines are supplied with steam from cylindrical boilers placed back to back and stoked from the wings, and they give 13,000 horse power without forced draft, and 18,000 with 2 inches of air pressure. The guaranteed speeds are 20 knots at the lower and 21¼ at the higher power, but these speeds were exceeded in practice. The boilers are worked at 150 pounds pressure, and the engines have a comparative short stroke, so as to keep the whole of the cylinders below the armored deck, which is 2 inches thick, and extends to the ends of the ship. The propellers work outwards, and vibration is small at all speeds. The high and intermediate cranks are set at an angle of 170 degrees, the two low pressure cylinder pistons having cranks at the same angle, one from the other, but the mean line of the latter is at right angles to the mean line of the high and intermediate cranks. The vessel's coal stowage is 700 tons normal and 1,450 tons can be carried all in bunkers, and this larger quantity may be considerably increased by temporary means without impairing the sea-going qualities of the vessel. The armament includes four 8-inch quick-firing guns, mounted by pairs, one pair forward and one aft, in gun houses of 6-inch Harvey steel, with an inner skin of an additional inch, and a flat cover 1 inch thick, with three sighting cowls rising about a foot above the cover. The ammunition lifts open directly into the turrets. The guns in the forward turret are 25 feet above the water-line, and the after guns 24 feet. There are fourteen 6-inch quick-firing guns, disposed as follows: Ten are in casements of 6-inch Harvey steel, two on either side forward and two on either side aft, in pairs over one another, with one more gun on either side of the main deck, each in an isolated casemate. The remaining four are behind shields, as upper-deck mountings. The lower tier of sponsoned guns is 12½ feet above the water-line, the upper about 20 feet. In addition to the above, twelve 12-pounders, and seven 1½-pounders, available for boat or land service, are in various parts of the ship.

The defensive armor, including the armored decks, is stated to weigh 2,100 tons, and is thus disposed: A belt of 7-inch Harvey steel, 7 feet deep, is along the water-line, 2 feet above it and 5 feet below; this belt tapers to 3½ inches at the ends of the vessel. Above the 7 inch belt is another of 5 inches thickness, which reaches beyond the turrets at either end, and is then bent inwards and across, forming complete athwartship bulkheads, protecting the bases of the turrets and generally shielding the vessel against raking projectiles; a belt of 6-inch plating which extends 25 feet aft from the stem on either side protects the bow torpedo tube. The Asama is supplied with four under-water torpedo tubes in addition to the one above water forward, and all are intended for torpedoes of 18-inch calibre. The main deck is in two thicknesses, each of ½-inch steel, and the ammunition lifts, where they rise above the belts, are circular tubes of 3-inch steel.

The upper deck is covered with teak, and this is practically the only woodwork that cannot be disposed of in case of action or fire. The fire-main is completely under the armored deck and has risers at intervals, each with its own valve, so the accidents which occurred in the Spanish ships at Santiago, from the destruction of their fire-mains, are guarded against. The bulkheads are of steel and the doors and cabin fittings alone are of wood. A flat 2-inch steel plate runs horizontally forward to strengthen the lower portion of the ram, whose upper side is adequately strong from the support afforded by the continuance of the armored deck right up to the stem. Her length is 408 feet, with 67 foot beam, and a mean draught of 24 feet, 8 inches, with the normal supply of coal on board. At this draught it takes 40 tons to sink her 1 inch.

The Admiralty and Horse Guards Gazette of London in an article on auxiliary vessels in war time, says: "They certainly did render service in American hands, and with their example before the world, it is beyond doubt that in future naval wars a more and more extended use for various warlike purposes will be made of vessels built and designed solely for the peaceful pursuits of commerce or ocean yachting. Already the largest and fastest of the great ocean liners are subsidized by the chief naval powers, with a view to calls upon their services in time of war, and in the latest of the great liners built or building special provision is made for the structural alterations which would be necessitated by their conversion into armed cruisers. Modern ocean liners such as the Umbria, Etruria, Lucania or Campania put to sea year in and year out utterly regardless of conditions of weather, and not only do so but maintain day after day in their trans-oceanic journeys an average speed which no warship could hope to rival for any prolonged period. The voyage of the United States battleship Oregon from San Francisco to the Caribbean sea, maintaining throughout an almost constant speed of about 15 knots, a feat unprecedented for a ship-of-war, and which justly reflects the highest credit upon the vessel herself and the navy to which she belongs, is yet one which a very ordinary mercantile steamer could surpass with ease."

The apportionment of new names for the United States army transports has been completed. The names are as follows, the old name being given first in each case and the new name following: Panama, Hooker; Port Victor, McClellan; Rita, Burnside; Mohawk, Grant; Mobile, Sherman; Massachusetts, Sheridan; Manitoba, Logan; Minnewaska, Thomas; Mississippi, Buford; Michigan, Kilpatrick; Roumania, Crook; Obdam, McPherson; Berlin, Meade; Chester, Sedgwick; Hartford, Terry; Clearwater, Ingalls; Scandia, Warren; Relief, Relief; Bay State, The Aid; Arizona, Hancock.

## OIL-FUEL APPARATUS.

ENGINEER-IN-CHIEF MELVILLE ANNOUNCES THAT THE UNITED STATES NAVY DEPARTMENT WILL EQUIP A TORPEDO BOAT WITH IT AS AN EXPERIMENT.

Engineer-in-Chief Melville of the bureau of steam engineering, navy department, is of late a prolific contributor to the technical magazines. In an article in the current number of Cassier's he makes the positive announcement that the United States navy department intends, on the recommendation of the bureau of steam engineering, to fit one of the torpedo boats with oil fuel apparatus, adding that if the bureau's anticipations of complete success be realized all American torpedo boats intended for operations on the American coast will probably be fitted for burning liquid fuel. "On the United States coast," he says, "representatives of the great oil companies give the assurance that fuel oil can be supplied in large quantities for less than 3 cents per gallon." Taking up again the subject of boilers the engineer-in-chief says:

"In boiler design it has already been shown how progress has occurred, and it may be said that the cylindrical boiler is today practically as perfect as it can be made, and that, while it is still the type almost universally used in merchant steamers, the water tube boiler has practically superseded it for naval vessels, and seems destined to do so in the merchant service. From many points of view there are numerous makes of water tube boilers in use today which are entirely satisfactory, but thus far it has seemed that the boilers which were most satisfactory on the score of lightness and economy, left something to be desired from the standpoint of facility of overhauling, cleaning and renewal of parts. On the other hand, most of the straight tube boilers, which are the easiest to clean and to overhaul or repair, have been heavier, and, at least as installed, have had the great objection of numerous units for the same power. This last is a very serious objection, as it means an enormous amount of work for the boiler attendants, even with automatic feed service, and also a greatly increased number of fittings and mountings.

"The outlook for the future with regard to design of machinery would seem to be that the type of engine is likely to remain the same as at present, inasmuch as the progress in recent years has been almost entirely in matters of detail, unless, indeed, the steam turbine should cause a complete revolution, and of this there does not, at present, seem a strong probability. For the boilers, in the writer's opinion, it is almost certain that the water tube boiler will entirely supersede the cylindrical. As to exactly which form of water tube boiler will become the common type, it is very difficult to say. The writer's own opinion inclines toward the view that the water tube boiler which will survive will have straight tubes of moderate diameter. It seems almost certain that heated draught and feed heaters will be essential features of this water tube boiler, whatever the exact form of the latter may be."

In an article in the March number of the Engineering Magazine covering something of the same ground, Chief Melville says: "So far as can be now seen there does not seem any probability of immediate changes so radical as the sudden jump in pressures from the compound to the triple expansion engine, the great increase in rotational speeds, and the abandonment of the cylindrical boiler for the water-tube boiler, which have already taken place. The demand will continue for higher speeds, and this means the further reduction of weight per unit of power. There will also be a steady effort for an increase of economy. These desiderata will give designers scope for the exercise of their talents. The need is obvious enough of such an organization among the engineers, mechanics and firemen of our merchant service who are accustomed to marine machinery and have the sea habit, as will enable the government, on occasion, to man the engine and fire-rooms with these men, who will need only a short training to make them feel at home and render highly efficient service."

## OCEANIC STEAMSHIP CO.'S NEW VESSELS.

The projected construction of three large modern steamers for the Oceanic Steamship Co. of San Francisco would seem to be contingent upon the passage of the Hanna-Payne bill, according to Mr. John D. Spreckels of San Francisco who is now in the east on matters relative to the award of the contract. In an interview, published a few days since, he is quoted as saying:

"Contracts for the vessels have not yet been awarded, and will not be till I learn the exact status and prospects of the Hanna-Payne shipping bill, which is now before the house. I consider that this is an excellent measure, well calculated in every respect to encourage the growth of such a merchant marine as we should have. The Hanna-Payne bill will, of course, benefit the ship owners for the first few years, but it will eventually be of benefit to the farmers and growers. It will give an immediate stimulus to ship building. The result of that will be that, in a few years, we will have enough ships to start a lively competition among the owners, in which case the owners will be able to do without the subsidy and give the farmers the benefit of it. Some one wanted an amendment attached to the bill giving the farmers a bounty, but that is wholly unnecessary, and it would, in my opinion, have a decided tendency to defeat the bill. The farmers will get the benefit of it eventually. The growth of the shipping, as fostered by the measure, will resemble the growth of the steel rail industry.

"The three ships which we propose to have built will be of 6,000 tons burden each, and of 8,000 horse power. They are calculated to have a speed of 17 knots, and a bunker capacity of 2,000 tons, with a freight capacity of 2,500 tons. They will have accommodations for 175 first class passengers, 100 second class and 100 steerage. They will be twin-screw steamers, 400 feet long by 50 feet beam. These are the dimensions and capacities of the ships as proposed, but they are liable to be changed. In fact, whether these dimensions will be adhered to depends very much on whether the Hanna-Payne bill goes through as it stands. We have three ships now running between San Francisco and Australia, which have the required speed, under the law of 1892, but they have not the required tonnage."

A number of heavy machine tools for the ship yard of Moran Bros., Seattle, Wash., are being built by Hilles & Jones of Wilmington, Del.



## KEELS LAID AND TRIALS MADE.

CONTINUANCE OF UNPRECEDENTED ACTIVITY IN ALL BRANCHES OF THE SHIP-BUILDING INDUSTRY—WHAT THE ENGINE BUILDERS ARE DOING.

There was launched a few days ago at the Roach ship yard, Chester, Pa., the ferryboat Philadelphia, building for the Pennsylvania railroad company, and which will run between Jersey City and the Twenty-third street station, New York city. The vessel is 206 feet in length over the guards; 200 feet on the water line; 46 feet beam, molded; 65 feet beam over guards; and 17 feet depth. She will be driven by two sets of compound engines with cylinders 20 and 22 inches by 24 inches stroke. Steam will be supplied from four Thornycroft water tube boilers. There are four propellers of cast steel, two at either end. The vessel is fitted with all modern improvements including steam steering gear and a complete electric light plant; will cost in the neighborhood of \$200,000 and will be ready to go into commission within a few days.

Ship building operations at East Boston, Mass., are active in the extreme. On the stocks at the Atlantic yard are the tugs Boxer and Teaser, building for the Union Towboat Co., of Boston. The Boxer is already planked and the Teaser is in frame and ready for ceiling. At William McKie's yard the ferryboat for the Boston, Revere Beach & Lynn railroad is in frame and partly ceiled, while at the yard of John McKie the keel has just been laid for a harbor towboat 65 feet in length and 17 feet beam. The machinery is being placed in the new ferryboat for the East Boston route, building at the Lockwood yard.

The Fore River Engine Works, Weymouth, Mass., is rushed with work. Operations are being pushed on the construction of torpedo boats for the United States government, and the company also has a contract to build a speedy steam yacht for Commodore Benjamin P. Cheney of the Boston Yacht Club. Another contract recently taken is for the triple expansion engine for J. Roger Maxwell's new steel steam yacht, now building at the yard of the Pusey & Jones Co., Wilmington, Del.

H. M. Bean, Camden, Me., has closed a contract for the construction of a five masted schooner for Capt. J. R. Potter of New York and work will be commenced immediately after the launching of the four-masted schooner building for Capt. Clarence Birdsall of Tom's River, N. J., and which will be put into the water early in June. The vessel just contracted for will be 240 feet in length, 44 feet beam and 21 feet depth, and will carry 3,500 tons of coal.

A passenger steamer of the Mississippi river type will in all probability be constructed this spring by a Waukesha, Wis., vessel owner for service on the Grand river between Grand Rapids and Grand Haven. It will be 150 feet over all, 33 feet beam, 4 feet depth, will have accommodations for several hundred passengers, and cost when completed in the neighborhood of \$17,000.

The Moran Bros. Co., Seattle, Wash., have just closed contracts for the construction of three large tugs. One is for the Puget Sound Towboat Co., the second for use by the Empire Transportation Co., between St. Michael and the mouth of the Yukon and the third for the Seattle Towing Co.

The Burlee Dry Dock Co., Port Richmond, S. I., is pushing work on the three steel barges building for the J. B. King Plaster Co. They are each 217 feet in length, 35 feet beam, carry 2,100 tons on 17 feet draught, and will be provided with automatic towing machines made by the American Ship Windlass Co., Providence, R. I.

The Ocean Steamship Co. (Savannah Line), has awarded to the W. & A. Fletcher Co., Hoboken, N. J., the contract to rebuild the engines of the steamer Nacoochee. The present compound will be changed to a triple expansion engine. Four new Scotch boilers, with a working pressure of 180 pounds, will be supplied.

John H. Dialogue & Son, Camden, N. J., have closed a contract with Chas. Clark & Co., of Galveston, Tex., for a steel tug for service in the Gulf of Mexico. She will be 122 feet long, 23 feet beam and 12½ feet depth of hold; will have compound engines and be completed within five months at a cost of \$40,000.

Work has been resumed on the steamer building by Capt. Charles Patch at Eastport, Me. A contract has been placed with the Union Iron Works of Bangor, for a 6-foot upright boiler and engines with cylinders 10 and 20 inches diameter by 14 inch stroke.

The George Lawley & Son Corporation, East Boston, Mass., will build a yacht for H. L. Eno of Saugatuck, Conn., on designs prepared by Tams & Lemoine of New York. She will be 70 feet water line, 93 feet over all, 20 feet beam and 8½ feet draught.

There is a prospect of a revival of ship building at Newburyport, Mass., once a seat of the industry. George E. Currier and Benjamin H. Hussey are mentioned as likely to engage in the construction of wooden schooners.

The government has let the contract for the floating dry dock to be stationed at Algiers, La., to the Maryland Steel Co., Sparrow's Point, Md. The contract price is \$850,000, with the stipulation that the dock is to be completed in eighteen months.

The steamers which Capt. R. A. Talbot, Seattle, Wash., is building for the Alaskan trade are each 120 feet long and 23 feet beam and will have a draught, loaded, of 3½ feet. Each will accommodate 400 passengers and 200 tons of freight and will cost \$20,000.

H. Elderkin & Co. of Port Greville, Nova Scotia, write the Review that Capt. James E. Pettis of that place is building a schooner of 450 tons and add that they expect to secure several additional contracts this spring.

The Lakeside Iron Works, Muskegon, Mich., will add a boat building department to their plant. A new building will be erected and the firm will make a specialty of the construction of gasoline launches.

It is announced that the steam yacht which the Pusey & Jones Co., Wilmington, Del., will build for William Hester of Brooklyn, N. Y., will be 128 feet in length, 16 feet 6 inches beam and 9 feet 9 inches depth.

Charles Ward of Kennebunk, Me., has taken the contract to build two

barges of 100 tons each for the Piscataqua Navigation Co., to be used in the transportation of brick.

W. P. Stearns, Marblehead, Mass., is to build a yacht 43 feet in length by 12 feet beam for Telford Groesbeck of Cincinnati, O.

George K. Philips & Co., Bethel, Del., are building a sailing vessel for D. J. Foohs & Co., Laurel, Del.

C. & R. Poillon, South Brooklyn, N. Y., will build a passenger barge for St. John's Guild.

## MARINE INSURANCE IN 1899.

"You may rest assured," says a lake underwriter who returned from a conference in New York a few days ago, "that marine insurance, not only on the lakes but in all parts of the world will be on a higher range of premiums for some time to come. I do not mean to say that there will be radical changes in lake rates or methods, but we all know that the American companies will still further cut down their lake lines, and that the business will be foreign even more than ever this year. I would therefore advise vessel owners not to hold off until the last day or two in placing their insurance. They may regret it."

Referring to the feeling that exists in marine insurance circles in England over losses of the past year, as shown by the annual statements, Fairplay of London says: "Accounts of all the marine companies which hold their meetings in the early part of the year have now been published. In view of the very numerous maritime disasters of last year a much worse set of statements might have been anticipated. But as it is, all the companies save one, the Sea, have failed to add to their reserves, which is a very noticeable feature, as in normal years most of the companies, the larger ones more particularly, make considerable additions to their reserves. The British & Foreign Marine Co., standing at the head of the offices by reason of its wealth and (as offering the highest security) commanding the choicest business, has the heaviest first year's settlement in 1898, namely, 52 per cent, which is no doubt largely accounted for by the fact that, to quote Mr. Tod at the World company's meeting, 'the best business was the worst last year.' At all the meetings the complaints of last year as to the inadequateness of premiums were renewed; but what has been done in the meantime? Underwriters have met in conference, and indulged in no end of discussion, but mutual jealousies have stood in the way of combined action, and without such action any hope of amendment in rates of premium is an empty dream. As the principal sinners are growing to be the worst sufferers, poetical justice may be regarded as effectually asserting itself. For some years they have been diligently sowing the wind; they are now reaping the whirlwind. The surprising thing is that, suddenly becoming oblivious of the conservative line of action by which their great resources were created, they should some years ago have launched out on the opposite tack of rate-cutting, carrying that practice to extremes probably not at first contemplated. The early underwriters of the older companies built up their reserves out of surplus underwriting profits; their successors, carried away by a reckless spirit of competition, are employing these accumulations as competitive fighting funds, and the end will be, if a return is not made to sound business methods, that the reserves put together by good underwriting will be dissipated by bad underwriting. If the area of marine business had been getting more and more restricted of late years, one could understand this extraordinary breaking out of rivalry; but shipping has been expanding phenomenally, both in the tonnage afloat and the value of cargoes, affording constantly increasing business for all the offices. This is why the recent—and present—rate-cutting conflict amongst the companies seems so difficult to account for. However, last year taught the combatants some useful lessons, which 1899 promises to rub in."

## BRIGHT OUTLOOK FOR THE SHIPS.

With every steel works, mill and furnace in the country running double time on orders that take up their capacity for the next two months, and with the manufacturers of steel and iron in all lines refusing to take orders, even at the present boom prices, for delivery extending over more than about two months, the vessel interests of the great lakes certainly have reason to look for a movement of ore limited only by the ability of the mining companies to dig it. The problem of dock equipment and cars at Lake Erie ports, and the question of facilities on railroads in the mining region, are both of importance, but after all the question is one of men to get out the ore. Every mining company is sold up for 1899 to practically the last ton that they can put into their estimates of production, and the late sales have been at marked advances over the prices at which the big sales were made. There will be no hesitancy about covering a great deal of these later sales by freight contracts at higher rates, if the present strong conditions continue for the next month or so in the iron market. The announcement a few days ago, that 65 cents a ton had been paid to a few vessels was taken with considerable surprise, on account of the great amount of vessel capacity that had previously been covered at 60 cents, but the advanced rate is not attracting any tonnage. There are no more vessels to be had at 65 cents than there were at 60 cents. It would not be surprising, therefore, in view of advancing prices in other lines, to hear of much better rates being offered. Duluth and Chicago elevators are full of grain and everything grows more favorable for the vessel owner as the opening of navigation approaches, but it is to be expected, of course, that the 60-cent contracts covering millions of tons of ore, will have a dragging effect on the "wild" rate.

This seems to be one of the years when, as the vessel man says, "there is no telling when the thing will stop." The export trade in iron and steel has increased probably 100 per cent within the past year, and it is no longer a question of what amount of material can be sold abroad, but rather a question of how much manufacturers care to sell. The local demand for iron and steel is such that no extra effort is being made to increase foreign trade, and, in fact, a large percentage of the orders placed from abroad come unsolicited. The lake vessel man cannot pin faith entirely to the demand for ore, as it is not possible to supply during the coming year the demand now in sight, but fortunately the outlook for business in grain, coal and other lines is almost equally encouraging.



## DEFENDER AND SHAMROCK.

MORE GOSSIP CONCERNING THE YACHTS WHICH WILL ENGAGE IN THE INTERNATIONAL CONTEST FOR THE AMERICA'S CUP NEXT AUTUMN.

It is claimed in dispatches from Bristol, R. I., that there is now positive proof that the under body of the new cup defender building at the Herreshoff works will be plated with Tobin bronze and that some light metal, probably thin steel, will be used to cover in the topsides. The work of setting up the frames for the boat is proceeding rather slowly, but this is caused by the careful manner in which the frames are riveted. In all there are 77 frames on the boat, and as they are spaced apart about 20 inches the length between frame 1 and frame 77 is 128 feet. There is a deck beam for every frame, and it will be of the same size as the frame to which it is fastened. Then there are angle frames, composed of nickel steel, three sixteenths of an inch thick, and rolled on the web with a half-inch bulb. From 1 to 12 the frames are  $2\frac{1}{2}$  inches on the web and  $1\frac{1}{2}$  inches on the flange, or the portion of the angle lying against the plating. The frames from 12 to 20 are  $3\frac{1}{4}$  by 2; from 20 to 45,  $3\frac{1}{2}$  by 2; from 45 to 53,  $3\frac{1}{4}$  by 2, and from 53 to 60, 3 by 2; and from 60 to 77, are  $2\frac{1}{2}$  by  $1\frac{1}{2}$ . The first frames going up at the mid-section give the impression of a difference between the new and old boats. The hollow section of the new boat is a trifle longer, but it is no easy matter to determine how much longer it is than the Defender. The port and starboard sections of each frame, with the top beam, are going up all jointed at the top. The work is being carried on deliberately and is being worked out in opposite directions forward and aft. More frames are set up forward of the midship section than are aft of the point. One very notable difference in the stern of the new boat from that of the '95 defender is that, where there is a straight line in part of the stern of the former, there is an upward curve or arch in that of the latter.

The real official length of the boat over all is still much of mystery, but to those who have looked on the plans and frames from day to day many of her exact figures are strictly familiar. In model she might be classed as an out-and-out fin-keeler. The lead keel is shorter and deeper than the Defender, which indicates a greater sail-carrying capacity and less commotion in going through the water. The keel is 30 feet long on top against 35 in the Defender. It is six feet deep at the heel and where its bottom line turns upward it is seven feet six inches. Forward from the heel the keel is flat for about 20 feet, then it turns upward in an easy curve, to a straight line of about 5 feet on the forward end. Judging from a sheer plan the new boat shows more of her forefoot cutaway than the Defender. The keel is straight on the bottom instead of "rockered," therefore she will hold on to windward much better than Defender, added, too, by the liberal plane. Her length over all is stated at 130 feet, and just the limit—90 feet—on the water line. Her beam is a couple of inches more than 24 feet and draught of about 20 feet. It is said that the weight of the entire lead keel is 90 tons.

A cablegram from London states that the Shamrock will be about 88 feet on the water line, 128 feet over all, and 22 feet beam. The Shamrock is rather flat forward at the stem, and her keel is of solid phosphorus bronze. Her hull is covered with a sheeting of phosphorus or gun-metal bronze to the water line, while from the water line to deck aluminum will be used, as in the Defender. The Shamrock will have a gun-metal deck three sixteenths of an inch thick, over which will be laid a pine flooring. The rudder will be sheathed in brass, with a thick band around it for strengthening purposes.

## EXTENDED USE OF PNEUMATIC TOOLS.

A representative of the Chicago Pneumatic Tool Co. the other day discussed the growing extent of the use of pneumatic tools in this country and abroad. In the course of his remarks, which, while addressed to persons non-conversant with the details of ship building are still of interest, he said: "This class of machinery has been developed almost entirely in the region of the great lakes, within the past few years. The different tools now turned out by the Chicago company are pneumatic hammers, breast drills, riveters, chipping and caulking tools, casting cleaners, piston air drills, flue rollers, expanders and cutters, flue welders and reducers, sand-papering machines and rotary drills. Large numbers are in use at the Cramp works, the Newport News yard, the Brooklyn navy yard and in the principal ship building plants in the vicinity of the lakes, as well as in the Bath Iron Works and leading railroad shops, boiler, bridge and structural iron establishments all over the Union.

"Hand riveting in ship yards is fast being done away with, and will soon entirely disappear. The pneumatic riveting machine or yoke riveter is adapted to inside work on ships, such as girders, brackets, beams, knees, stringers, etc., and is also applicable to floor work. It consists of a pneumatic hammer mounted in gimbals on the end of a pipe 8 or 9 feet long, the gimbals allowing the hammer to be swung in any direction, so as to get at the rivet from all sides as in hand riveting. Chipping tools, reamers and caulkers may be used in connection with the riveting machine, which is adapted to riveting on all kinds of iron work. The work of the chipping hammer would amaze an old-time metal worker, for the keen-edged chisel driven by the sharp, quick stroke of the pneumatic hammer, which has no vibration, cuts metal almost as easily as it does wood.

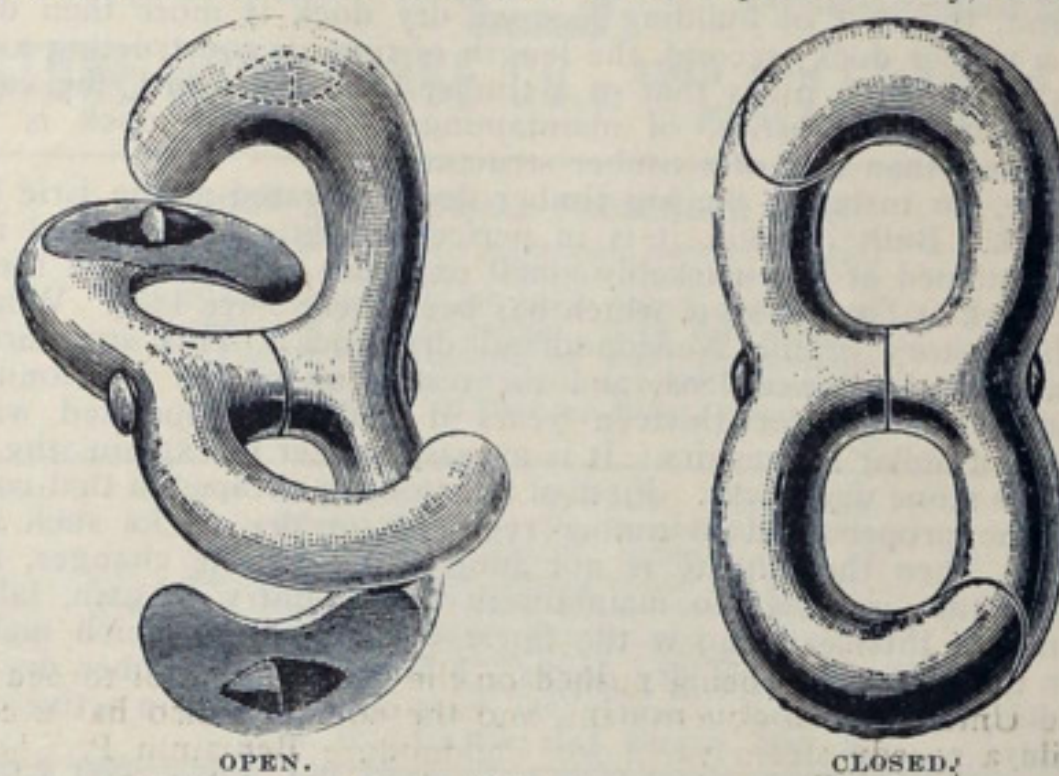
"With a pneumatic riveter, every rivet in a ship can now be driven with power and at a cost only from one-third to one-half as great as the cost of hand work. A record of 450  $\frac{7}{8}$ -inch rivets driven in a day with a single machine has been reached, and in rush work this number could be exceeded. At the regular rate for hand riveting, namely,  $3\frac{1}{2}$  cents for  $\frac{7}{8}$ -inch rivets, 450 rivets would have cost \$15.75, whereas the cost with the machine was about \$6. A very important result of the invention is that it will end the alleged abuses that employers have suffered on account of the unreasonable demands of the riveters. The company has also introduced a pneumatic painter, which throws the paint on a surface in a fine, even spray."

WANTED—To charter for two years—Small tug or steam launch. Must make at least 15 miles an hour. Major Sears, Duluth, Minn.

March 9.

## FOR REPAIRING CHAINS.

The Keystone open link, which is illustrated herewith, is made of similar halves, drop forged from bar steel and centrally pivoted on its axes, which, in closing brings together two abutting lugs located on the inner and overlapping surfaces, making it necessary to completely shear off these before the load can rend the link, and which is found to be practically as sound as a solid welded chain of equal size. This link has come to be an almost indispensable article on board ship, in ship yards, railroad shops, and in fact in any place where chains are used to any extent and where their breaking would cause much expensive delay, were it not



for the fact that with the Keystone link repairs can be made in a moment. The simplicity of the link's construction is such as to permit of its being instantly applied without the use of tools.

The Keystone open link is made in sizes from  $\frac{1}{4}$  inch up to  $\frac{3}{4}$  inch, inclusive. The sole manufacturer is the Keystone Drop Forge Co. of Philadelphia, Nineteenth and Clearfield streets. This firm is engaged in the manufacture of special forgings of every description, for which they will quote prices on receiving information as to the character of the work. They manufacture and keep in stock standard wrenches, hoist hooks, eye bolts, shafting collars, machine handles, thumb screws, rope sockets and swivels and many other similar articles.

It has been said that the big tow barges in the lake trade, carrying no sail, cannot be classed as sailing vessels and will not come under the new law relating to sailing vessels. Nothing could be further from the truth. The law was intended for just such vessels. In the list of merchant vessels of the United States published by the treasury department there are three distinct classification,—steam, sail and unriggered. The unriggered vessels are mostly canal boats, lighters, etc., and will probably not come within the requirements of the law. The whaleback vessels of the great lakes are also placed in the unriggered class, as regards these there may be some questions on this account, but everything of more than 700 tons included under the heading "sail" in the government list will undoubtedly be required to comply with the law.

Capt. Wm. W. Brown, who has retired from the management of affairs of the Ship Owners' Dry Dock Co., Cleveland, has been making arrangements for some time past to enter into a stock and bond brokerage business in Cleveland, not of the speculative kind but to deal in first-class securities. Capt. Brown's business experience will serve him well in this regard, and he will have the other advantage of having made a study of securities of the kind that are changing hands more or less in and around Cleveland. He is especially adapted to the work. He will have a connection with a New York house that will prove quite advantageous in dealing with the local trade.

Employees of the Maryland Steel Co., Sparrow's Point, Md., were given a 10 per cent raise in wages last week. Work is progressing nicely in the marine department, and the immense plant presents a very busy appearance. The steel plant was hampered somewhat, a short time ago, by inadequate ore supply, but the company is now receiving three shiploads a week from Cuba, as well as considerable from the lake ore region.

A student course of from five to eight years duration has been a feature of the factories of the General Electric Co., whose export trade amounts to 90 per cent of the entire electrical exports of the United States, and it is now announced that where students from foreign countries show the requisite ability, they will, upon graduation, be given charge of the company's branches in the various cities of their home countries.

Members of Toledo Marine Engineers Beneficial Association were entertained in a very elaborate manner a few evenings since by M. E. B. A. No. 48 of Sandusky. There was a meeting at which instructive addresses were made and later the entire party was tendered a banquet.

Quite a large number of costly tools will soon be required at the Brooklyn navy yard to replace those destroyed by the recent fire. It is estimated that the loss on account of the fire will approximate \$1,000,000.

The Vulcan Shipbuilding Co. of Stettin, Germany, is said to be acquiring land at Lehe (Hanover, Prussia), for the purpose of laying down a ship building yard at that place.

Ten days stop-over at Washington.—Tickets to Philadelphia and New York over Pennsylvania short lines may be obtained via Washington, and good for a ten days' visit at the national capital, at the same fare as apply to Philadelphia and New York over direct lines of Pennsylvania system. For further particulars apply to Pennsylvania lines ticket agents or address C. L. Kimball, passenger agent, Cleveland, O.



## TIMBER VERSUS STONE DRY DOCKS.

The controversy in naval and ship building circles as to the relative merits of stone and timber dry docks continues to wax interesting, and it is quite evident that if the advocates of timber docks have been comparatively silent up to this time, it should not be taken as an indication that they intend to have the champions of masonry structures enjoy a monopoly of the presentation of arguments. A representative of one of the largest builders of timber dry docks in this country, who wishes his name withheld, has prepared a statement that covers the discussion from his standpoint pretty thoroughly. He says in part:

"First, the cost of building a stone dry dock is more than double that of a timber dock; second, the length of time in constructing a stone dock is about three times that of a timber one, and, third, the cost, as shown by actual statistics, of maintaining a stone dry dock is many times greater than that of a timber structure.

"Take, for instance, the big timber dock operated at the Erie basin, New York. Built in 1864, it is in perfect condition today, and it has been maintained at a remarkably small expense. The same of the timber dry dock at East Boston, which has been there since 1853. What has been the history of the Newfoundland dry dock? This structure has been in operation since 1884, and the testimony of the Newfoundland government is that for thirteen years it had been operated without expending a dollar for repairs. It is an easy matter to explain why England builds stone dry docks. First of all, stone is cheaper in that country than is the proper kind of timber required for dry docks such as we use here. Then the climate is not subject to extreme changes, and a stone structure is easier to maintain in that country. Again, labor is cheaper over there, and so is the finest cement, all of which makes it cheaper to build the stone dry docks. I know of one timber dry dock in London, however, that is nearly 200 years old, which is in active operation today.

"In this country we have only four stone dry docks, and I see no tendency to build many more of them. The Newport News Ship Building & Dry Dock Co. is now building the largest timber dry dock in the country, and they ought to know what they are doing, for they have been operating a timber dock since 1889. Of the five new dry docks to be built by the government, three will be of timber, one of stone, and one of steel, the latter the floating Algiers dock. The Boston dock will be of granite, while the League Island, Portsmouth and Mare Island ones will be of the timber variety. You must remember that the term timber dry dock is a misnomer, in some respects. Investigation will show you that concrete enters largely in the construction of these docks. We use concrete in the bottom and in the entrance ways or abutments. You will find from 3 to 4 feet of solid concrete in the bottom of every timber dry dock, and the abutments are practically concrete with timber facing.

"In the construction of dry docks there is one thing of great importance to be considered, and that is the original cost. There is the granite dock at the Brooklyn navy yard. The original cost was \$1,998,803.46, and \$250,000 has been expended upon it in repairs. The Mare Island stone dock cost \$2,800,000, and since 1891 it has cost \$75,000 to keep it in repair. The timber dry dock at the League island yard cost \$548,700, and since 1891 it has been kept in repair at a cost of \$10,000, and of this amount \$4,000 was expended in raising the coping of the dock. Generally speaking we should say that it would cost \$2,000,000 to build a granite dry dock 500 feet long, and about \$600,000 a timber dock of the same dimensions. Now the interest on the difference in first cost would yield at 4 per cent., compounded, a sum sufficient to build an additional timber dock of the same size every ten years, and leave a balance of \$72,000 for repairs; also that the interest of the difference in cost between one granite dock and two timber docks (\$800,000) would yield \$32,000 per annum for repairs, or \$384,000 at the end of ten years—more than enough to keep them in repair forever. It takes about from two to three years to build a timber dock of, say, 700 feet, while the least time consumed in building one of the granite dry docks at the United States navy yards was more than six years.

## U. S. TIN.

The Marine Review had occasion, not long ago, in correspondence about advertising to ask the Ajax Metal Co. of Philadelphia for information regarding their products. Following is their reply:

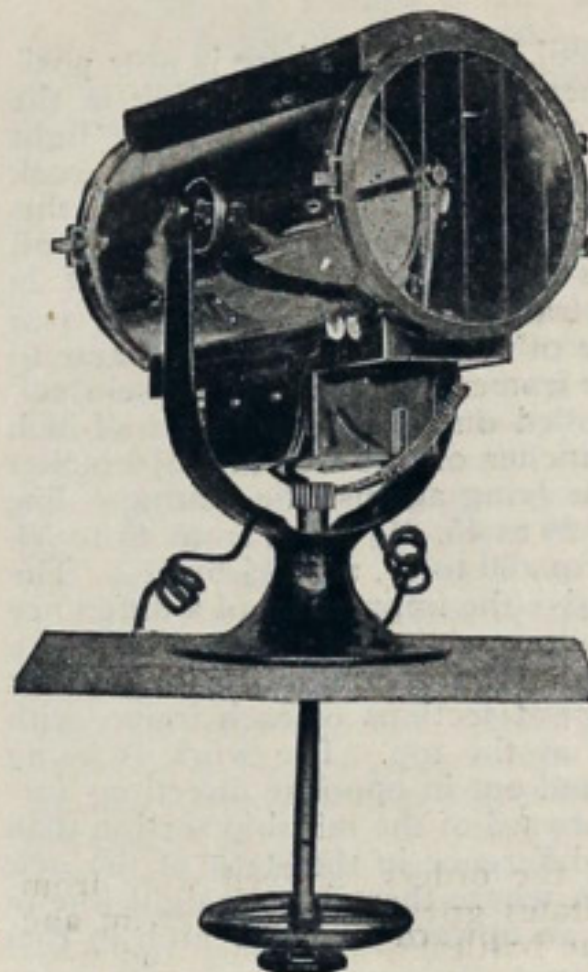
"Eighteen years ago we began marketing our Ajax tin, which, used with the formula we furnished, made our celebrated Ajax bearing metal. Since then we have sold millions of pounds per annum, and the metal has gained both national and international reputation, second to no other that is made and sold on the market. Having been successful in marketing our Ajax tin for bearing metal we conceived the idea of placing on the market a tin that could be used in place of imported tin, and now offer to the users of composition metals our U. S. tin for making all manner of castings in which tin enters into the composition. We propose offering the U. S. tin at a figure so much lower than imported tin that it will be attractive in price and will make a much superior metal, sounder castings, more homogeneous in structure, richer of color, of greater tensile strength, and a better wearing metal in every way. The composition made of U. S. tin is much richer in color, makes a high lustrous polish, and does not tarnish when exposed like alloys made of imported tin. It is a great metal to work, turning much better, and cleaner cut, and is in fact far superior to imported tin in every way.

"U. S. tin can be used in the same proportions as imported tin. The difference we make in price and the superiority of the metal, and soundness of castings, should persuade all users of metal to send us their orders. We will send to responsible parties small lots of U. S. tin on approval. If it proves satisfactory we will make contracts covering a given time for their wants. We know we are right when we make the statement that U. S. tin is superior to imported tins."

Mr. Isaac M. Bortle, who recently retired from the position of general passenger agent of the Northern Steamship Co., with offices at Buffalo, has been appointed district passenger agent of the Northern Pacific railroad at Philadelphia, to fill the vacancy caused by the death of John H. Rogers.

## IMPROVED PROJECTORS.

There is illustrated herewith some of the new types of search light projectors made by the Carlisle & Finch Co. of Cincinnati. It is claimed for the search lights made by this company that they possess the great advantage of burning equally well in any position. It makes no difference whether the lamp is pointed up vertically or in a horizontal position, the length of the arc and current consumed remains the same.



9-INCH PROJECTOR.

The Carlisle & Finch Co. make projectors from a 7-inch yacht light to the largest marine projectors. The first illustration represents a 9-inch projector, which is a great favorite with owners of yachts and small steamers. This projector is but 19 inches high over all and weighs but 35 pounds. It will render visible objects at a half mile with ease.

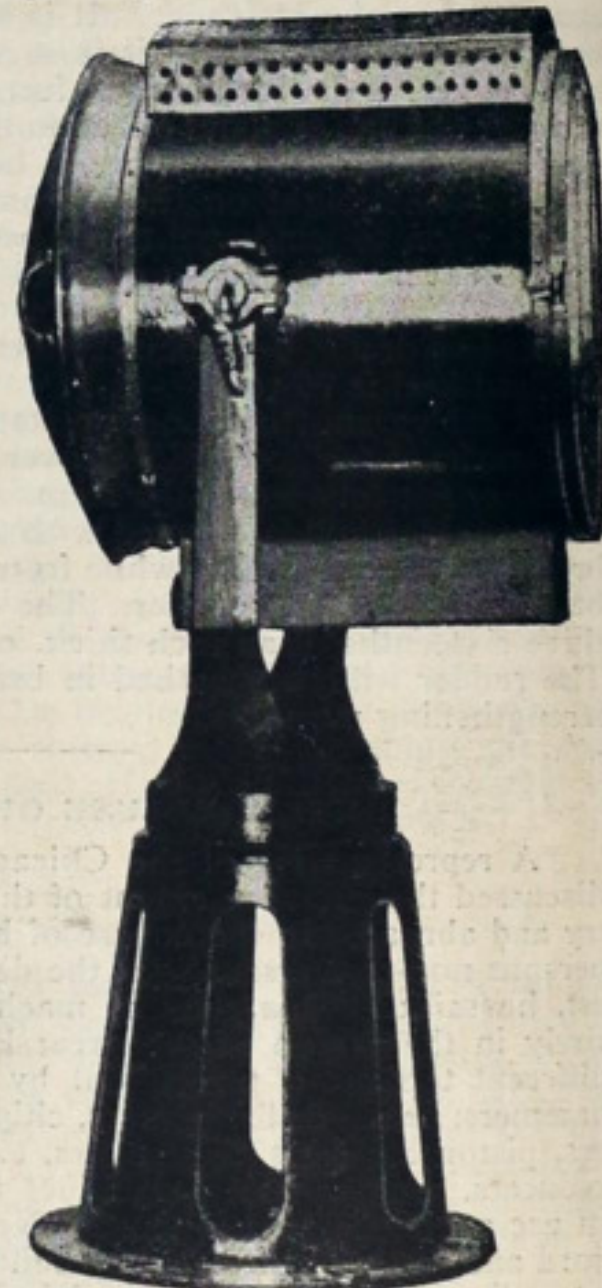
Particular attention is directed to the means provided for turning and elevating the light from within the pilot house. The larger hand wheel is attached to a hollow shaft, which controls the horizontal movement. The small wheel transmits motion to the gear, which meshes with the segment of a gear attached to the body of the lamp. This device renders the vertical elevating and depressing of the light extremely easy and is without doubt the simplest device of the kind in use. The second

illustration shows the type of projector used on the forward deck of vessels when it is to be turned and elevated by hand. The height to center of the lamp cylinder is such as to bring the handles in a convenient position, the total height over all of this type of lamp being about 5 feet.

All search light projectors of 14 inches diameter and larger are provided with contacts in the base of the stand, so that the light may be revolved in a continuous circle, the revolving part being supported on a train of steel balls, which render it very easy to turn. Search Lights for river steamers are fitted with a different type of steering gear than that shown. As the lights are usually placed at the bow of the boat and are to be controlled from the pilot house, it is necessary to run light wire cables between the two. One cable is passed around the revolving drum of the search light and attached to it by a clamp, while another cable passes around a sheave pulley below the lamp and gives the vertical motion through a suitable mechanism.

The Carlisle & Finch Co. furnish special reflectors for river steamers when it is desired to throw a widely spreading beam of light. This is especially desirable in very narrow rivers, where it is necessary to illuminate both shores. The standard reflectors furnished by this company will throw almost as good a beam as a lens mirror, but of course the light is not of such intensity. Their lens mirrors are very accurately ground and are of great power. They are of the same type as are used in the United States navy.

All the Carlisle & Finch Co. search lights are provided with small hand wheel and focussing screw, by means of which the light may be changed instantly from a straight, narrow beam to a widely spreading beam.



DECK TYPE PROJECTOR.

Assistant Secretary Allen, as referee for the board of bureau chiefs of the navy, has decided that electricity shall not be applied in the working of boat cranes, anchor winches and other deck auxiliaries on the new battleships building, except the Kearsarge and Kentucky, which are to have this power under a previous order. Admiral Sampson, Admiral Schley, Capt. Cooke of the Brooklyn, and other commanding officers of the fleet in front of Santiago, earnestly recommended the substitution of electricity in place of steam for such use, and the board being divided on the question, Assistant Secretary Allen was left to decide the point raised. Electricity has been satisfactorily used on many of the ships now in service for auxiliary machinery, but several members of the board believed that it would be wiser to wait further developments before directing its further application. Those members of the board who voted for steam power were Capt. O'Neil, Capt. Bradford and Engineer-in-Chief Melville. Constructor Hichborn and Commander Clover were the advocates of electricity.

The sundry civil appropriation bill, which was passed in the closing hours of the late congress, provides for the construction of a light-house tender and a revenue cutter for the great lakes. The latter is to cost \$165,000, and one-half that amount is appropriated to begin the work of construction. It is thought that the vessel will not be ready to go into commission inside of two years.



## TRADE NOTES.

The Pusey & Jones Co., Wilmington, Del., has secured a contract for machinery for the Red D line steamer under construction by the Harlan & Hollingsworth Co. of Wilmington, Del.

The Commercial Publishing Co., 84 California street, San Francisco, has again issued a list of vessels owned on the Pacific coast and Hawaiian islands. This list is always carefully prepared and gives full particulars of the vessels, together with names and addresses of managing owners.

Orders for stockless anchors aggregating over 200,000 pounds weight are on the books of the Baldt Anchor Co. of Chester, Pa. This firm lately got out a very unique souvenir, a miniature anchor, the requests for which so greatly exceeded expectations that the supply was exhausted immediately.

Foundations of a part of the projected additions to the Westinghouse plant at East Pittsburgh have been laid, and it is the company's intention to rush the work of building as rapidly as possible. At a recent meeting of the stockholders, it was voted to increase the capital stock to \$3,000,000, and to double the capacity of the works.

The George F. Blake Manufacturing Co., New York, has received an order from their European agent to supply the entire equipment of air pumps for the Russian warship now being built in Germany. This is the second order this firm has received for Russian ships under construction in Germany. They are also furnishing the entire pumping equipment for the new North German Lloyd steamship Deutschland.

The Lidgerwood Manufacturing Co., 96 Liberty street, New York City, manufacturers of improved hoisting engines, boilers and suspension cableways, write the Review that the year just closed has been the most successful in its history. A majority of the orders received were from ship building concerns and the United States government for steam and electric hoists and winches for use on the battleships, cruisers and merchant ships.

**The Erie & Western Transportation Co. Offer**  
**FOR SALE** *Gordon Campbell,*  
 THEIR STEAMER  
 NOW AT BUFFALO.

Price, fifteen thousand dollars (\$15,000) cash. For details address

E. T. EVANS, Western M'gr.,  
 BUFFALO, NEW YORK.

# DROP FORGINGS TO ORDER

## STANDARD

Wrenches, Hoist Hooks, Sock ts. Eye  
 Bolts, Shafting Collars, Machine  
 Handles, Thumb Screws and  
 Nuts, Swivels, &c., &c

## KEYSTONE OPEN LINKS.

Send for Catalogue and Discounts.

1886



## SPECIAL

## FORGINGS OF ALL KINDS.

Send Model or Drawing and  
 Get our Prices.

May Reduce Present Cost.

**KEYSTONE DROP FORGE CO.,** 19th and Clearfield Sts.,  
 PHILADELPHIA, PA.

## HIGH-SPEED SMALL PASSENGER BOAT.

**WANTED**—To purchase, new or second hand boat, of light draft, from 60 to 90 feet in length, of high speed, capable of carrying 50 to 60 people. Give full details. Builders also invited to make proposition for construction of such a boat. Address Alex. J. Jones, 707 Tacoma Bldg., Chicago. Mar. 9

**U. S. ENGINEER OFFICE,** Vicksburg, Miss., March 2, 1899. Sealed proposals for excavating 7,500,000 cubic yards of earth, more or less, along route for diverting mouth of Yazoo River, near Vicksburg, Miss., under continuous contract, will be received here until 3 o'clock, p. m., April 5, 1899. Information furnished on application.

J. H. WILLARD, Maj. Eng'rs. Mar. 23.

E. M. DICKKY, President.

WM. HOPKINS, V. Pres't.

EUGENE P. KIENE, Sec'y.

## IOWA IRON WORKS, LIMITED,

Founded 1851.

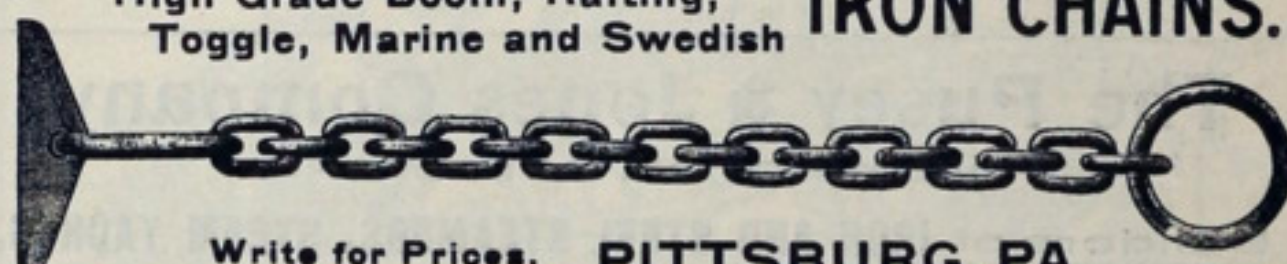
DUBUQUE, IA.

Engineers, Machinists, Founders and Boiler Makers, STEAMBOATS and STEAM-BOAT MACHINERY. Architectural Iron Work.

## JAMES MCKAY & CO.

Manufacturers of all kinds of

High Grade Boom, Rafting, **IRON CHAINS.**  
 Toggle, Marine and Swedish



Write for Prices. **PITTSBURG, PA.**



## The Hulett Car Dumping Machine

FOR HANDLING COAL AND ORE.

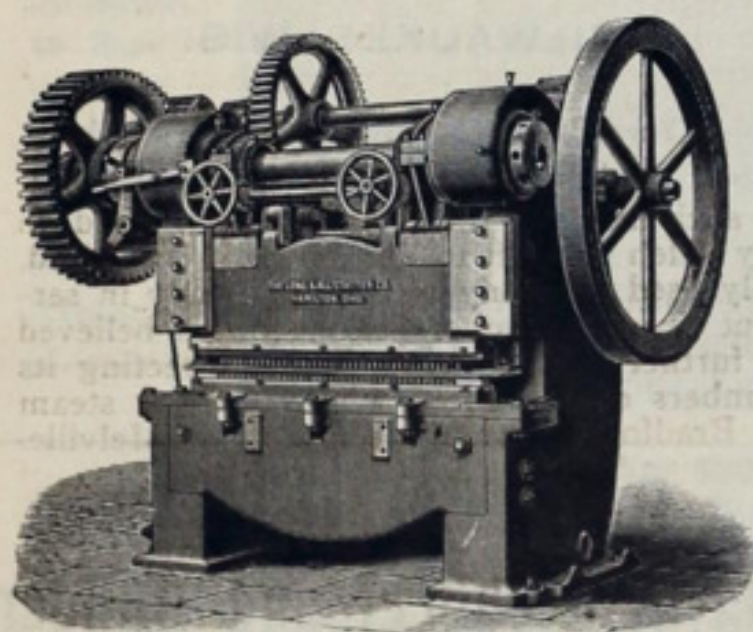
LEAST POSSIBLE BREAKAGE

OF COAL. RAPID HANDLING.

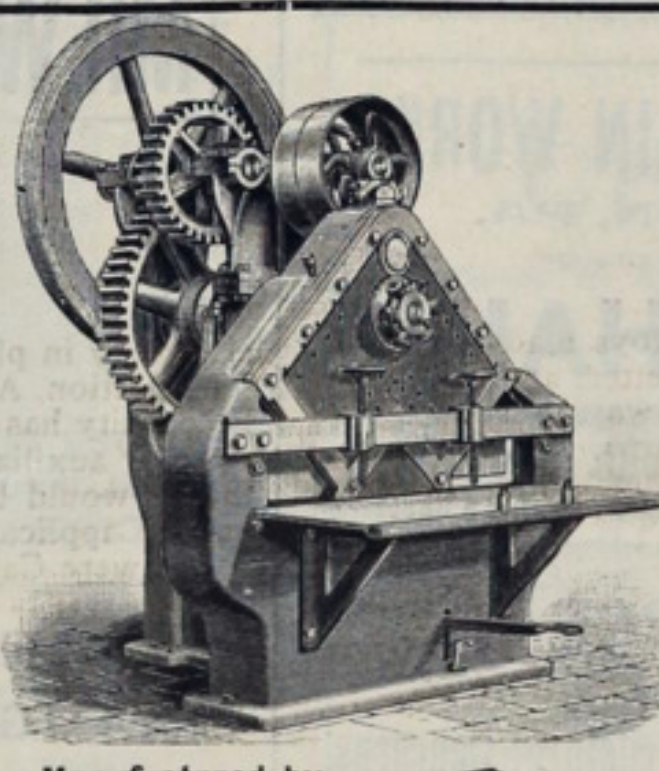
**Webster, Camp & Lane Machine Co.**

AKRON, OHIO.

## LABOR SAVING.....

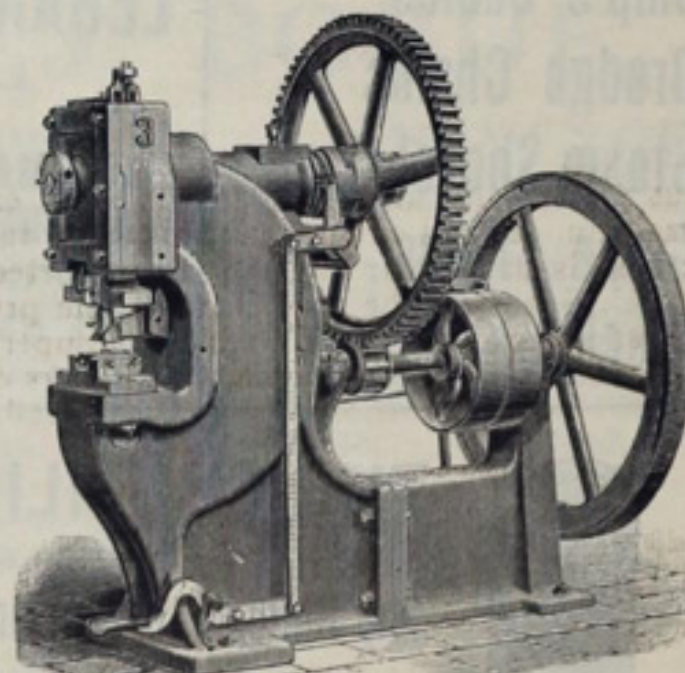


Belt,  
 Steam  
 or  
 Electric  
 Driven.



Manufactured by

## POWER SHEARS



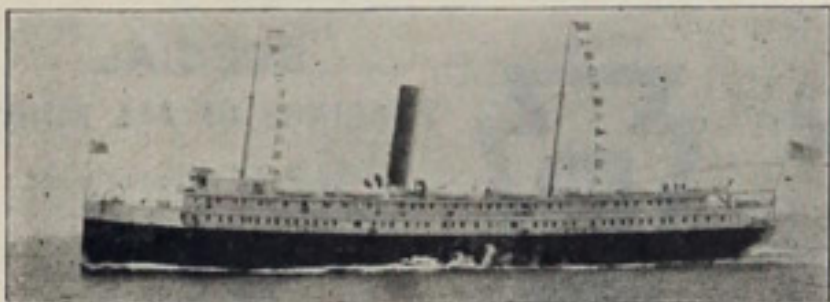
Belt,  
 Steam  
 or  
 Electric  
 Driven.

## POWER PUNCHES

The **LONG & ALLSTATTER CO.** HAMILTON, O.



## ROACH'S SHIP YARD.



DELAWARE RIVER  
IRON  
SHIP-BUILDING &  
ENGINE WORKS,  
CHESTER, PA.

Builders of Steamships and Marine Machinery.  
SHIP-BUILDING IN ALL ITS BRANCHES.

New York Office, Morgan Iron Works, Foot East Ninth St

## Newport News Shipbuilding & Dry Dock COMPANY.

WORKS AT NEWPORT NEWS, VA.  
(On Hampton Roads.)

Equipped with a Simpson's Basin Dry Dock capable of docking a vessel 600 feet long, drawing 25 feet of water, at any stage of the tide. Repairs made promptly and at reasonable rates.

### SHIP AND ENGINE BUILDERS.

For estimates and further particulars, address

**C. B. ORCUTT, Pres't,**  
No. 1 Broadway, New York.

## The Pusey & Jones Company,

WILMINGTON, DELAWARE.

Builders of IRON AND STEEL STEAMERS, STEAM YACHTS,  
TOW BOATS, MARINE ENGINES, BOILERS, TANKS,  
AND OF HEAVY MACHINERY GENERALLY.

ALSO COPPERSMITH WORK.

SPECIAL FACILITIES for REPAIRS to both WOODEN and METAL BOATS.  
MARINE RAILWAY. NO WHARFAGE CHARGED.

## TOMPKINS SMOOTH ON COMPOUND,

FOR MAKING PERMANENT REPAIRS ON BOILERS OR PIPING.

It can be used on all permanent joints, main stay braces, stay screw nuts, and in all repairs such as applying temporary boiler patches. Write for catalogue.

### SMOOTH ON MFG. CO.,

VREELAND TOMPKINS, B. S., CHEMIST AND MANAGER,

Telephone 81-A BERGEN.

547 Communipaw Ave., JERSEY CITY, N. J.

Ship's Cables  
Dredge Chains  
Steam Shovel Chains  
Crane Chains  
Block Chains

## LEBANON CHAIN WORKS,

LEBANON, PA.

MANUFACTURERS OF

HAND-MADE AND  
MACHINE-MADE **CHAINS**  
OF ALL GRADES.

WE MANUFACTURE OUR OWN IRON.

All our Chains are tested. High Grade Chains a Specialty



## THE CRUMLISH FORGE

For Rivet Heating.

USED BY THE LEADING

Ship Builders, Bridge Building and Structural Concerns.

**CRUMLISH FORGE CO.**

Send for Circular.

BUFFALO, N. Y.

INCORPORATED 1794.

## Insurance Company of North America.

CAPITAL, Paid up in Cash, - - - \$3,000,000.00  
ASSETS, - - - - - 10,173,488.90

CHARLES PLATT, President.  
EUGENE L. ELLISON, Vice-President.  
BENJAMIN RUSH, Second V.-Pres't.

GREVILLE E. FRYER, Sec'y & Treas.  
T. HOWARD WRIGHT, Marine Secretary.  
JOHN H. ATWOOD, Assistant Secretary.

## Lake Marine Department.

GEORGE L. McCURDY, M'gr,  
CHICAGO, ILLS.

## Chas. E. & W. F. Peck,

58 William St., NEW YORK CITY.

Royal Insurance Building, CHICAGO, ILL.

### C. T. BOWRING & CO.,

5 and 6 Billiter Avenue, E. C., LONDON, ENG.

## INSURANCE

BROWN & CO., . . . 202 Main Street, Buffalo, N. Y.  
PARKER & MILLEN, 15 Atwater St., W., Detroit, Mich.  
J. G. KEITH & CO., 138 Rialto Building, Chicago, Ill.  
LA SALLE & CO., Board of Trade Bldg., Duluth, Minn.

Are prepared to make rates on all classes of Marine Insurance on the Great Lakes, both CARGOES and HULLS.

## GREAT LAKES REGISTER,

COMBINED AND ISSUED IN CONNECTION WITH THE

## BUREAU VERITAS

INTERNATIONAL REGISTER OF SHIPPING.

GREAT LAKES REGISTER DESIRES TO ANNOUNCE THAT ITS RATINGS GO BEFORE THE LEADING UNDERWRITERS OF AMERICA, ENGLAND AND FRANCE.

THE SERVICES OF ITS SURVEYORS MAY BE ENGAGED ON HULL AND CARGOES.

F. D. HERRIMAN, SURVEYOR GENERAL,  
ROYAL INSURANCE BUILDING, CHICAGO, I



## THE MANHATTAN RUBBER M'FG CO.

No. 212 Champlain Street,  
CLEVELAND, OHIO.

W. D. ALLEN, AGENT,  
151 LAKE STREET, CHICAGO, ILL.

Marine Valves, Hose  
and Steam Packings  
of all kinds.



W. E. FITZGERALD, President.  
F. C. STARKE, Vice President.  
A. M. JOYS, Sec'y and Treas.

## MILWAUKEE DRY DOCK COMPANY



MILWAUKEE, WIS.

South Yard Dry Dock, 450 ft. on Keel Blocks.  
West Yard Dry Dock, 312 ft. on Keel Blocks.

RUDDER PIT TO UNSHIP RUDDERS IN EACH DOCK.  
STEEL AND WOOD REPAIRS A SPECIALTY.  
ELECTRIC LIGHTS ON EACH DOCK.

YACHTS,  
TUGS,  
LAUNCHES,  
REPAIRS.

## A. G. GUTHBERT,

Naval Architect and Builder.

Yard: 92d St. and Calumet River.

Office: 141 S. Water St. CHICAGO, ILL.